CHEMICAL INDUSTRIES

VOLUME XXXV NUMBER 4

The Start

WHEN a cyclone devastates Kansas the state legislature does not abolish clapboard walls and tin roofs by law though it might be easily demonstrated that in the crisis they proved to be unsuitable materials for homes. If the Mississippi breaks bounds in a great flood, nobody considers this a good reason why all dykes and dams and levees should forthwith be leveled. Although all sailors know that every ship in the path of a hurricane may drag its anchor, still they do not think that an anchor is an antiquated device, useless under the conditions of modern navigation. Yet these are the arguments for the abandonment of the gold standard.

The world has not been forced off the gold standard. We have all been forced off the peace standard. After the war the peace made by the politicians created in its debts and reparations a fantastically impossible financial situation. Forced to juggle and shift the financiers wrecked a monetary system never designed for such loads. The result has been a very violent depreciation of money that has simply wiped out all sane business calculations and killed orderly economic development. The gold standard has not broken down. It has stalled. What fails in cyclone or flood is not shown to have broken down as a method of normal life.

While the gold standard may conceivably be destroyed, it will not break down, and the world will not be forced off gold, until a legally fixed price of gold in a free market fails to bring forth supplies of new gold sufficient to maintain an adequate foundation of safe credit to carry on the world's business. Far from having reached that point, evidence is fast piling up that the universal, first requirement for the restoration of normal peace conditions the world over is a sound and stable monetary system. Until we are back on peace, that is, until it is possible for business men to plan reasonably and for industry and commerce to function orderly, no man can honestly say what changes may be necessary in our economic system. Recovery must come before reform, and the first step towards recovery is sound finances.

The Right to Make Ice

"Additions to productive capacity" without the explicit permission of the Code Authority is forbidden in the ice industry. Accordingly, when the enterprising owner of some second-hand ice making machinery, deeming the time ripe for making a profit selling ice in Florida, rents a building and begins putting together his plant, General Johnson cracks down. A number of codes contain similar provisions, but so far as we know this is the first case to come up in which no question of wages or hours or any other code provision is in dispute.

To question the right of an American citizen to engage in any legitimate business enterprise he jolly well pleases, is a fit subject for discussion at the Mad Hatter's tea party; but we might find it profitable to consider a moment the ideas behind this apparently ridiculous proposition, and if followed to its logical conclusion, to speculate where it would land any chemical process industry.

Without half trying one guesses why the icemen incorporated this provision in their code. The shrewder among them had an inkling that their fine "partnership with Government" could be made into a monopoly in which nobody else was ever again going to share nohow. They were going to freeze the ice business as of the date the President accepted their code. It's a good trick—if it works. But to work it must assume first, that the ice market is frozen, and second, that they will be able to freeze all progress in the technique of refrigeration.

This is piling absurdity upon absurdity, yet this is very serious nonsense. For there are in Washington any number of bureaucrats who are eager to make just these same dangerous assumptions. The whole A.A.A. crop reduction plan is founded squarely on the presumed ability of Government officers to guess correctly all the natural hazards of agriculture as well as what the consumption of the American people will be next year and the right of these same omnipotent officials to create monopolies for the benefit of men now in farming. By accepting such codes the N.R.A. accepts these same assumptions and takes unto itself the same powers.

These freezing practices would be particularly fatal in chemical industries. Interchangeable raw materials and varying yields; by-product utilization and waste disposal; new products and new processes make the chemical manufacturer dangerously susceptible to freezing to death, while the risks of exposure are greater even than in ice making.

The Market for Chemists

Complete enough and in sufficient number to bear weight, the records of the Chemists Unemployment and Relief Committee, in New York indicate that roughly three-quarters of the Ph.D. chemists graduated last June have already been absorbed into the industries; but that less than a third of those with shorter training have been able to find positions. In both groups, the personal recommendation of the student's teacher is apparently more important than the name of the college or university where he was trained. By the time he is thirty years old, most employers expect a chemist to have become highly specialized in some particular line. At forty, even with the required, definite experience, they are not interested in him at all unless he has very special qualifications or has demonstrated great ability. At all ages, and throughout all grades of training and experience, the most important factor is the personality of the man himself.

Present conditions magnify almost to the point of prejudice the inclinations of employers seeking technical help, and while the experiences of the active workers in the office of this Committee are neither new nor startling, nevertheless they do indicate plainly the contradictory conditions set up. We may well question the good sense of demanding highly specialized experience under forty; but we may not doubt that this is the demand or that it represents a natural, not an abnormal, condition.

The industry has not hesitated to complain that our universities and technical schools were sending them the wrong kind of chemists, and the professors have maintained that the industrialists did not know what a good chemist ought to be. The facts developed above form the basis at least for a mutual understanding that character is as important as chemistry and that quality is more needed than quantity. A detailed study of the individual records of this Committee, checked by careful interviews with as many of the unemployed chemists and engineers as possible and re-checked by the opinions of the office staff, would reveal to a well chosen group of chemical educators a fund of practical information that would be of rare value to the teachers and the students in their charge, to the chemical industry and the chemical profession.

The banquet is on. Barring the unexpected appearance of the waiter with the check, the Maine election results are only a foretaste of what is to come. Whether the crowd will stay after the meal is over is another matter.—*Wall Street Journal.*

Some Comparative Costs of

CELLULOSE

as a Chemical Raw Material

By Harold A. Levey

FEW products of Nature occupy the unique and intriguing position as a chemical raw material as does cellulose. Unlike other basic natural organic materials, its supply is not only abundant and cheap, it is also readily replaceable in the relatively short time of an annual crop's harvest period.

Cellulose occupies in the vegetable kingdom a more or less parallel position to that of bones in the animal kingdom. It gives form and rigidity to plant life. The cellulose fibres are bound together by lignin, somewhat as the muscles do the bones of the vertebrates. However, this lignin and especially an intermediate material called ligno-cellulose are not so readily and completely separable from the cellulose itself, as are muscles and tissues from bones. Frequently such drastic chemical and physical treatment is required to effect a complete separation that the cellulosic structure itself becomes modified. When used in chemical processes it must, of course, be freed from all non-cellulosic material. In fact, its utility will be based largely on that least soluble of the three forms of cellulose, designated as alpha cellulose.

In chemical industries cellulose is converted into more useful physical forms. These ends are commonly achieved by dissolving the cellulose and then removing the solvent. This is the method used in the formation of sheets, films, filaments, and lacquers, while molded objects are formed using a solid solvent which remains associated with the cellulosic material, giving the mixture plastic properties.

To effect solution it is invariably necessary to prepare first a derivative of the cellulose. In some cases solution may be used to convert the cellulose into the desired physical shape, and then regenerate the cellulose; while in other cases the cellulose derivative forms a colloidal solution in a volatile solvent, shaped as desired, and the solvent removed by evaporation.

The purity and quality of the initial cellulose is dominant in controlling many desirable properties of the finished product. Among these might be mentioned strength, color, workability, and stability. While it is now generally recognized that all cellulose, no matter what the source, has the same constitution or structure, nevertheless the molecular aggregate, the size of the molecule, or number of $C_6H_{10}O_5$ units in each molecule is indeed very different. Cellulose from cotton comes to us in a nearly pure state. The cellulose from woods and grasses has to be subjected to such harsh chemical treatment that the molecular aggregate is reduced in size. The cellulose of reduced molecular aggregate usually has less strength and flexibility. This condition is more pronounced in such derivatives of cellulose as the esters and ethers, than is the case with the regenerated cellulose from both the viscose and cupra-ammonium processes.

Few natural organic compounds are in such a state of purity, available at so low a price, as cotton cellulose. Accordingly, the cost of treating or converting the cellulose into the desired form usually amounts to several times the cost of the cellulose. All the chemical reagents, used in preparing the derivatives or the regenerated cellulose, cost more than the cellulose itself, except the caustic soda used in forming soda cellulose in the viscose process. In addition, in most processes the weight of the conversion reagents required is more than that of the cellulose used.

To be more specific, in the case of regenerated cellulose, the caustic soda may cost 2.6c per pound and the carbon bisulfide 5.5c per pound. This means that the cost of the reagents per pound of raw cellulose (or regenerated cellulose) is 7.5c. To this must be added the cost of the chemicals for dissolving, coagulating, and purifying the regenerated cellulose, which approximates another 2.5c, making a total of 10c for chemicals or about four times the cost of the raw cellulose.

In the manufacture of cellulose nitrate, the cost of the nitric acid, based on 40° acid at 6c per pound, costs 8c, and the sulfuric acid a little more than 1.5c per

pound of cellulose nitrated. So the reagents in this process cost three to four times the cost of the cellulose used. When cellulose acetate is manufactured this condition is even more extreme. Acetic anhydride is the usual acetylating agent and is quoted at 21c per pound. More than two pounds are used per pound of cellulose, so that the cellulose cost is proportionately

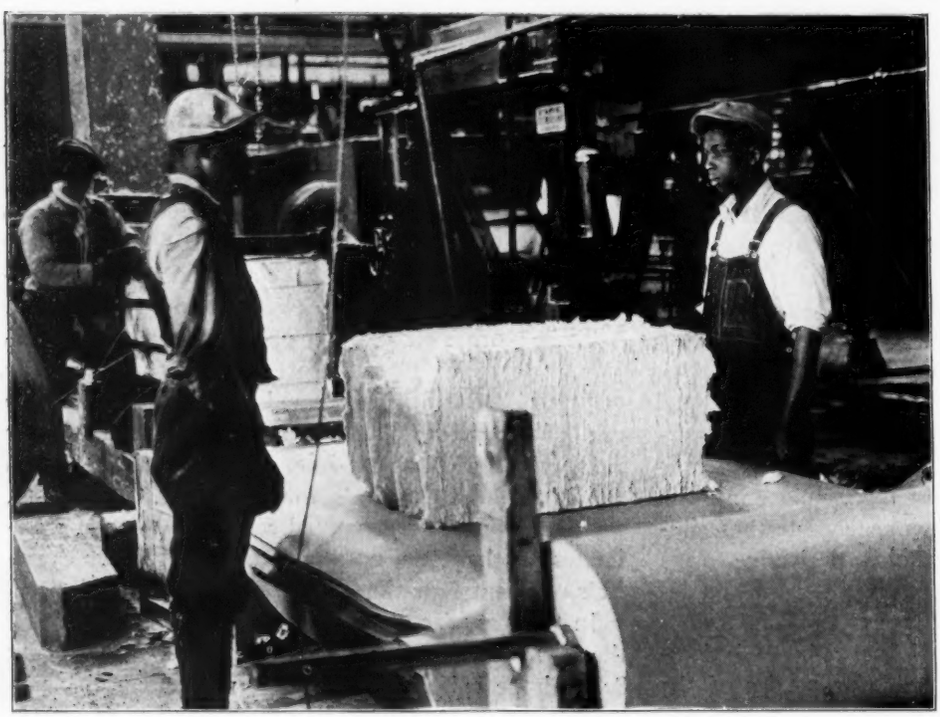
Showing remaining growing stock after pulp wood cutting has taken place. Photograph courtesy U. S. Government Southern Forest Experiment Station.

insignificant in the manufacture of this product. Even though this yields about 1½ pounds of cellulose acetate, the acetic anhydride cost per pound of cellulose is around 30c. In addition, an appreciable amount of glacial acetic acid is used, and while both the excess acetic anhydride and glacial acetic acid is recovered as dilute acetic acid, the recovery cost is quite a factor. As a result the reagent cost is more than *ten* times the cost of the cellulose.

Notwithstanding these facts many industrialists and research workers are intensely seeking ways of reducing their costs through the two channels of using a lower grade of the cellulose or another form procurable at a lower price.

In view of our present activity in reforestation, we have no fear of a shortage of cellulose as such, where it is to be used without subjecting it to any chemical change, as for lumber and paper. This is especially true in the case of paper, which can be made economically from trees five to seven years old such as slash and loblolly pine, and even in white stock, according to the new process of Dr. Herty. Striking results have recently been achieved by government workers in Washington who have prepared a white pulp of a very high alpha cellulose content from an annual grass, the bagasse from sugar cane. Comparable results can be attained through similar grasses, corn, rice and wheat, all of which are available in large quantities and as by-products from their respective industries. On the basis of today's conditions, however, these grasses cannot compete commercially because of the cost of gathering and transporting to centers of manufacture, as well as their lower yields of usable cellulose.

These sources of cellulose, while available in larger quantities and at somewhat lower prices (based on alpha cellulose) than cotton linters, can only be used as the cellulosic constituent for the manufacture of regenerated cellulose, or relatively low viscosity cellulose derivatives, essentially cellulose nitrate as used in lacquers. Due to reagent and plant costs, it would obviously be false economy to use a lower priced source of cellulose than that best suited for the specific application desired. In the light of the above, cotton linters will probably lead the field in supplying the cellulose for those derivatives which require high viscosity plas-



Baling cotton cellulose—purified cotton linters.

A cotton grower in his prize field of cotton. He made little more than two pounds per acre and won $1.000 prize offered by the Georgia State College of Agriculture.

tics for their applications in order that the ultimate product may possess the desired physical properties. These linters are the very short fibres which adhere to the cotton seed. Because of their shortness, they find no use in the textile industry. As they are the complete equivalent, chemically, of the longer fibres, they have, except for the very slight increase in their cleaning cost, the same value as a chemical raw material. The yield of the cotton crop for 1933 was 13.1 million bales, or about 6.5 billion pounds, while the linters amounted to 741,000 bales or 370 million pounds. The price range of these linters varied from 1½c to 3½c per pound. Obviously, this is a relatively lower price, based on cellulosic content and cellulosic chemical value, than the cost of cellulose available from the other sources mentioned above.

In the more limited application of cellulose as a raw material for chemical manufacture, in which the products formed are either degradation products or derivatives resulting from the disintegration of the cellulose nucleus or structural rearrangement of the molecule, the distinctions drawn above play no part. In the wood distillation industry both the cellulosic and non-cellulosic constituents supply valuable products. Several chemical products are obtained from cellulose by fermentation, pyrolysis, acid or alkali treatment, and the like. These materials include several sugars, furfural, formic, acetic, oxalic, lactic acids, alcohols, and some esters.

The products available from cellulose as a starting point are probably as numerous as those from coal-tar. Much has been learned of the chemistry of cellulose since the World War, but infinitely more is yet to be discovered. While we do not yet know the constitution or structure of the cellulose molecule, we are probably quite close to it. We have not been able completely to synthesize cellulose chemically, but it has been accomplished bacteriologically from the sugars. Some years ago the particular sugars used for this synthesis have themselves been synthesized from their elements by wholly chemical means. These syntheses of cellulose are of value insofar as they contribute to our knowledge of the constitution of the cellulose molecule, how we may better or more economically work it for our particular uses, and how to control these reactions. Obtainable in such abundance

Sugar cane field near harvest time in the "sugar bowl" of Southwest Louisiana.

and grown in such a short period, with so little effort and care, it is not probable that in the near future we would contemplate competing with Nature for our supply of this commodity.

Acknowledgement: The author wishes to express his thanks to the New Orleans Association of Commerce for their kindness in supplying the very relevant photographs illustrating this article.

Scope of a Chemical Patent

By Charles W. Rivise

Caesar and Rivise

ALL patents with the exception of those for designs have the same duration; namely, seventeen years. However, they vary quite widely in the degree of protection which they afford. Many patents are of such narrow or restricted scope that they cover only the specific improvements described in the specifications. Others are of such breadth that they include within their scope substantial variations in detail. A relatively few are of such broad inclusive scope as to cover devices (a term which covers processes, machines, articles and compositions) which show very little, if any outward or physical resemblance to each other or to the devices disclosed in the patents.

One such patent is Patent No. 1,061,770 to Miller litigated in the case of General Electric Co. vs. Continental Fibre Co., 256 Fed. Rep. 660. Miller, the patentee had been the first person successfully to produce a gear wheel of highly compressed cotton. The patent specified that the cotton was to be held under compression by metallic end plates and secured by rivets passing through the compressed material. A disk or blank made in this manner can be provided with teeth in the same way as had long been practiced with metallic blanks. Miller's patent was held to be of such broad scope as to be infringed by a gear made of cotton duck impregnated and surrounded by cured Bakelite. The sole function of the Bakelite in the infringing device was exactly the same as that of the metal plates and rivets of the patent, as there is no chemical change wrought by the union between the cloth and the Bakelite. The cloth remains cloth and the Bakelite, Bakelite.

Another patent that was accorded a fairly broad scope is Patent No. 250,247 to Holliday (Read Holliday & Sons vs. Schulze-Berge, 78 Fed. Rep. 493). The patent described a coloring material consisting of the sulfo-conjugated compound of rosaniline, but was held to be of a scope sufficient to include such homologues of rosaniline ($C_{20}H_{21}N_3O$) as para-rosaniline ($C_{19}H_{19}N_3O$), methyl para-rosaniline (the C_{20} compound) and dimethyl para-rosaniline (the C_{21} compound) as well as trimethyl para-rosaniline (the C_{22} compound), which at the time of Holliday's invention, had not as yet been isolated as an individual.

In the case of a broad patent, the device described in the specification is deemed as only one of many possible forms of construction in which the inventor may embody his inventive concept, while in that of a narrow patent the disclosed device is considered either as the invention itself or as one of a relatively few forms in which the concept may be incorporated. Variations in the form or details of the device disclosed in a patent which fall fairly within the scope of the patent are known in the patent law as "equivalents." It follows that the broader the patent, the greater or wider its range of equivalents and the greater the degree of protection afforded the patentee against those who would appropriate the sum and substance of his inventive ingenuity. However, the broader the patent, the more likely it is to be held invalid when sued upon, for conceivably a broad patent is more likely than one of restricted scope to embrace devices and things which are either old or which do not constitute parts of the patentee's invention. A narrow patent is more likely to be sustained by the courts, but it can be more easily evaded by a competitor.

Much litigation and more disappointment arises out of failure properly to understand the limitations, both broad and narrow, of a patentable chemical idea, and this understandable discussion, by a well known Philadelphia patent attorney and author, sets up some definitions very useful in avoiding disastrous mistakes.

It has often been stated that an inventor is entitled to a patent commensurate in scope with his advance over the prior art. Actually this is an ideal which is achieved in only a very small proportion of cases involving broad inventions. The reason is

* *Copyright 1934 by Chas. W. Rivise.*

that a patent does not necessarily cover what the inventor may have actually invented. Nor does it necessarily cover what is described in the specification of the patent.

What a patent actually does cover is what is properly described in the specification and adequately defined in the claims. No matter how valuable, new and novel the actual invention or discovery, no matter how accurate the description in the patent, the inventor must adequately cover and define it by means of his claims; otherwise, he will be deemed to have intended to abandon it or dedicate it to the public. Hence, it follows that the claims of a patent may be so restricted as to cover less than what the patentee actually discovered and invented. Likewise, the claims may be limited to one particular form of the device disclosed excluding all other forms though they may also embody the inventive concept.

The fact that the disclosure (the specification and claims of a patent when read in the light of the drawings) has been held to be sufficient to support a valid patent does not necessarily mean that it is adequate to secure to the patentee the full measure of protection to which he may be entitled. To achieve this desirable purpose, the specification must clearly set forth the essential physical conditions for the accomplishment of the novel result by which the invention is characterized so that the Court will have sufficient criteria to ascertain the true scope of the invention. Otherwise, the scope of the patent may be limited to the specific structure of the disclosed device, in which case competitors will find it a relatively simple matter to embody the essential characteristics of the invention in a non-infringing structure or process.

The following are the facts of Tyler v. City of Boston, 7 Wallace 327. Tyler had obtained a patent on an invention which made it possible for petroleum oils to be utilized for illumination without smoking. Ordinary kerosene was mixed with crude fusel oil in equal portions, it being stated that part or all of the kerosene might be replaced by naphtha or crude petroleum. The specification failed to state that the tendency of the hydrocarbon fluid to smoke when burned upon an open wick was dependent upon the relative amount of carbon in its composition and that this should, therefore, determine the proportion of fusel oil to be added to the hydrocarbon to prevent smoking. The defendant substituted naphtha for Tyler's kerosene and found it necessary to use 72 parts of naphtha to 28 parts of fusel oil instead of equal portions as disclosed by Tyler. Hence the defendant escaped liability for infringement, though he actually utilized the very essence of Tyler's invention, i.e., adding a sufficient amount of fusel oil to prevent smoking.

The foregoing case may very well be contrasted with that of Schwarzwalder v. New York Filter Co., 66 Fed. Rep. 152. Patent No. 293,740 to Hyatt covered a process of purifying water by the use of coagulants such as perchloride or persulphate of iron and was based upon the discovery that the coagulants can best perform their principal work within the filter bed itself. Accordingly, the coagulant was placed into the water as the water was being introduced into the filtering apparatus. In this way, the patentee dispensed with the use of settling tanks and with the additional chemical treatment of the water which was previously considered essential. The specification clearly set forth the essential physical conditions under which the process could be practiced and hence the defendant was held to be an infringer, though he used alum as the coagulant instead of the iron salts.

As a general rule, an inventor is entitled to couch his claims in such broad terms as to include within their scope substantial variations from the device or thing which he has dissolved in the specification, provided the claims are not so broad as to be indefinite or vague or to read upon prior constructions and practices. Furthermore, the claims should not be so broad as to cover devices which are obviously inoperative.

The foregoing rule as to broad claims has its limitations when applied to chemical inventions. When an inventor discovers and discloses that a particular chemical compound will accomplish a desired result, he is not as a matter of course entitled to a claim of such scope as to include all substances which will accomplish that result. Nor is he necessarily entitled to claims of such scope as to cover even a more limited field of elements or compounds such as a group of elements, compounds, or substances classified in chemistry as a class or type of compound.

The reason in back of this limitation is that the action of materials in a chemical way cannot be foretold, except in cases of limited and well-established, definite and usually small groups of compounds, classified together because of common or analogous properties and actions. But, even in the case of known classes of substances, there is often a question as to whether one member of a class will act in the same manner as another in a particular situation. As a matter of fact, two members of the same class do not always act alike, otherwise, they could not be distinguished.

If an inventor pursues his investigations far enough to be able to say that he has tested a reasonable number of the members of a chemical group and finds that they act in the same way, he may be entitled to a claim of such scope as to cover the entire class. The Patent Office will not as a general rule allow such a claim, unless it appears from the original specification with reasonable certainty that the applicant realized at the time of filing the application that all members of the class or group were operative.

In other words, the original disclosure must be sufficient to raise the presumption that the inventor had made a generic rather than a specific invention. The applicant may meet this requirement by setting out in

the specification as examples a reasonable number of substances falling within the group or class, or by clearly pointing out in the specification the essential attributes, characteristics or determinants of the group or class.

Broad chemical claims were allowed in each of the following cases because sufficient basis therefore was contained in the specification.

Ex parte Weber, 2 U. S. Pat. Q. 187 (Patent No. 1,720,406). The invention related to a process of molding a resinous composition which had become too hard to work by incorporating a plasticizer. The specification stated that the process was applicable to phenol-formaldehyde resins, "Bakelite 420," tar acid formaldehyde, magnesium oxide resin, shellac, urea-formaldehyde resin and acetone-formaldehyde resins and mentioned a number of possible plasticizers including hexamethylene-tetramine-triphenol, hexa-xylenol, hexa-cresol and the corresponding compounds of the polyhydric phenols and of the naphthols. Weber was therefore allowed a claim calling broadly for the reworking of *resins* with a plasticizer such as hexamethylene-tetramine-phenol.

In re Ellis, 1911 C. D. 374; 167 O. G. 981 (Patent No. 1,000,388). The following claim was allowed because the specification as originally filed contained from 15 to 20 suitable substances in support of the expression in italics:—"The finish-remover comprising composite finish-solvent material including a liquid, finish solvent, *ketonic derivative of a cyclic CH_2 hydrocarbon.*" Among the examples given were the cyclic paraffins including cycloheptane or pentamethylene, vinyl trimethylene, suberane or cycloheptane, hexahydrobenzenes or naphthenes embracing hexahydrobenzol and hexahydrotoluol.

The foregoing case is to be compared with that of In re Dosselman, 1911 C. D. 379; 167 O. G. 983. An application which matured into Patent No. 1,014,211 disclosed a varnish or paint remover consisting of benzol, acetone, and paraffin. It was specified that instead of benzol, other coal-tar and petroleum products could be used and that any wax material could take the place of the paraffin, but no substitutes or equivalents for acetone were mentioned. It was, therefore, held that the applicant was not entitled to a claim calling broadly for ketone.

Caution to Inventors

It follows from what has been said that inventors should be cautioned against rushing to the Patent Office with an incomplete invention or before they have had ample opportunity to ascertain the full significance of what they have invented. Not that the invention must be brought to a high state of development in its mechanical or chemical details, but without proper study and investigation, it is rarely possible so to describe and define the invention as to secure to the inventor the full scope of the protection to which he may be entitled.

Industry's Bookshelf

Practical Mine Development and Equipment, by Lucien Eaton; 405 pages; McGraw-Hill. $5.

Practical discussion of the problems met in mining. Book is the outgrowth of a series of articles in *Engineering & Mining Journal,* and will appeal strongly to the man in the field.

A Study of Crystal Structure and Its Applications, by Wheeler P. Davey; 695 pages; McGraw-Hill. $7.50.

A very practical and complete book, and will serve as an aid to laboratory work on crystal structure and its applications.

Technical Gas Analysis, by George Lunge, revised by H. R. Ambler; 410 pages; Van Nostrand. $8.

Prof. George Lunge's book, 1st written 20 years ago, has long been considered authoritative. Advances in technique, and discovery and application of a number of gases made extensive revision necessary. This has been admirably done.

Practical Everyday Chemistry, by H. Bennett; 305 pages; Chemical Publishing Co. $2.

Book contains hundreds of formulas for making polishes, pastes, lacquers, photographic materials, everything that the young or old chemical experimenter is likely to want to undertake. In addition, practical directions make the work quite simple. Book is not simply an adjunct to the usual "Christmas chemistry set" for children. It is extremely practical and valuable to one working on chemical specialties, although the *Chemical Formulary,* by the same author, is undoubtedly much more complete for this purpose.

The New World of Science, by A. Frederick Collins; 300 pages; Lippincott. $2.50.

An entertaining and instructive story of the mighty advances that have been made in the various divisions of science in the last few years. To those who would like to have at least a speaking acquaintanceship with men of science and what they are accomplishing in the leading laboratories of the world this book is strongly recommended. Much of the data were obtained in connection with the exhibits at the Chicago Century of Progress Fair.

Arbitration in the New Industrial Society, by Frances Kellor; 256 pages; McGraw-Hill. $2.

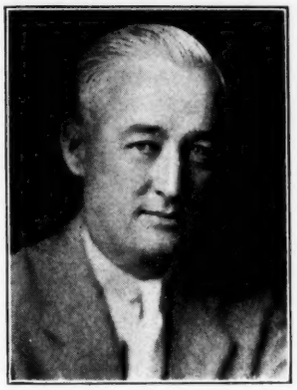
A very lucid account of the development of the arbitration idea in American industries to date, and an optimistic forecast of the possibilities in the future. The book is a very interesting and practical resume of the technique of arbitration as developed to date.

Forward from Chaos, by A. T. Young; 185 pages; Nisbet & Co., London, 6s net.

A solid "made in England" plan for a controlled industry through means of boards on which there would be two representatives each of management, stockholders representing capital, labor and consumers. A patient and well thought out program with an extremely interesting review of the present industrial situation the world over.

Practical Business Statistics, by F. E. Croxton and E. J. Crowder; 529 pages; Prentice-Hall. $3.50.

A comprehensive text book with the smack of workaday reality because of the extremely well chosen practical examples used to illustrate the various methods of collecting, tabulating and interpreting all sorts of business statistics.



Not Bureaucracy---Co-operation, *Says*

Captain Joseph F. Battley

In an interview with Walter J. Murphy

"BUREAUCRACY is the wrong word to use in any connection with the N.R.A., which is a co-operative movement between business and government."

Upon that platform the new Acting Division Administrator, who has been placed in charge of the seventy-two codes in the Chemical Division, stands firmly. With forty-four chemical manufacturing codes and sub-codes, twelve chemical products' codes (ink, glue, fertilizers, shoe polishes, etc.), twelve paint codes, and four codes in the manufacturing drug industries Captain Battley is friendly to the idea of self-regulation of industry and believes that N.R.A. administration is being simplified; and, as he puts it, "the wrinkles ironed out."

He is a reasonably busy individual and although frank and willing to talk, getting a chance to put his views before the readers of CHEMICAL INDUSTRIES is like trying to grab a bubble out of a mill race. He was waylaid by strategy outside the closed door behind which he was in conference with the soap and glycerine code-ists. While waiting for someone who might carry my card in to him, a tall, slim man with a shock of prematuredly white hair topping a youthful ruddy face, slipped out of the sanctum and picked up the telephone in the anteroom. When he had finished I asked if he would take in my card. He nodded and, with a friendly smile, slipped back without even glancing at the card. In a short moment he re-appeared, with a cheerful grin.

"I'm your man," he said with a merry twinkle in his blue eyes, "What can I do for you?"

The incident doubtless is typical of the man, and the chemical and allied industries can be sure that the one person in N.R.A. whom they will contact most, possesses a sense of humor, does not stand upon ceremony, is friendly, easy to meet and devoid of "military bearing."

"Not a chance" was his reply to my request for an interview appointment. "It is just impossible. I am booked solidly through the rest of the day and evening."

"Not more impossible, Captain," I replied, "than for me to return without the interview."

Again that friendly smile. I sensed he was weakening, and pressed upon him a set of questions the industry wants to know about. Motioning to a couple of chairs close by, he sat down and glanced at the short list.

"Are you receiving the full support of the chemical industry?"

"The answer is decidedly in the affirmative," the Captain answered. "Of course in any industry you will find some who do not want to join any co-operative effort. That is just what N.R.A. is. But I am glad to say that the number of those with this viewpoint in the chemical field is negligible. You have, fortunately, very few 'chiselers'."

He read aloud the second question, "Are the codes operating smoothly?"

"Again the answer is 'yes' Quite naturally there have been troubles to be ironed out, honest differences of opinion to be dealt with. Not all of these problems have been solved, but they will, because in the chemical and allied manufacturing industries you have an exceptionally high type of executive, progressive, well-trained, capable of appreciating the value of the co-operative effort now possible through N.R.A."

"As to the third question," the Captain continued, "unquestionably those divisions of the chemical industry that were well organized previous to the advent of the N.R.A. have received the most benefit from the Act so far. They were in a position to adjust quickly and efficiently to the new conditions. The fertilizer industry, with a splendid trade association as a background, is an outstanding example. Another is the paint group. The others, nevertheless, are all making notable progress in the right direction."

"Where do the distributors fit in the new set-up?" I asked.

"Distribution, that is selling, and production or manufacturing, will be grouped separately in the new plans, although, unquestionably, some provisions will be made for consideration of problems touching both

the producer and the distributor," was his reply. "The chemical engineering equipment code, of course, will remain with the machinery and allied products."

Indiscriminately Blamed

Discarding the formal set of questions, Captain Battley turned to the more general aspects of the N.R.A. "There is a growing tendency to blame many ills of industry on the Recovery Act and its administration. That is unfair. N.R.A. has been blamed for higher prices. The Administration is not in favor of price fixing. In fact, every policy has been opposed to it, and it is erroneous to say that the system of open filing of prices is price fixing or tends towards higher price levels. I can cite hundreds of specific examples in one industry alone to disprove thoroughly the allegations. Prices are unquestionably higher, but so are the prices for ingredients, and likewise, so are the selling prices of products. The policy of the President is to gradually raise the general price level."

Cooperation is Vital

Reverting once more to the administrative side of the codes, Captain Battley remarked that in this message to the executives of the chemical and allied industries he wished to stress that the entire success of this phase of the President's plan for recovery is dependent upon their co-operation with one another as well as with Washington; that they now have a golden opportunity to eliminate destructive competitive features which business men have been complaining of for the last five years, but "like the weather, could do very little about."

"What about the future of the N.R.A.?"

"That is something I cannot answer," he replied. "We are awaiting the President's reorganization plans. Until these are definitely formulated and announced, we are not in a position to do any prophesying; but you may be sure of one thing, and that is, that self-government will play a very prominent part."

Captain Battley talked quite freely without much urging. Summed up into a few words, he decries the indiscriminate use of the word "bureaucracy"; rather does he prefer to stress the fact that N.R.A. is an experiment in self-control, in self-government, backed by Congressional authority; that in a little over a year it has proven a boon to a number of industries; that that which is found to be objectionable and unsatisfactory can be eliminated and the good retained.

Leaving, I asked if he enjoyed his work.

"Hard work, yes, but extremely interesting. You know I feel that I am one of the industry," and in a sense he is. Graduate of the Harvard University School of Business Administration, he served as Executive Officer of the Chemical Warfare Service at Edgewood Arsenal; studied at the Army Industrial College, and for several years was in charge of procurement in the New York and Pittsburgh area, the most important chemical section of the country. He knows chemistry, the industrial leaders (and they him), and of paramount importance, he understands the problems these executives face. Not only does he understand, but his viewpoint is sympathetic and cooperative. Yet despite those friendly blue eyes and engaging smile, I would hate to go A.W.O.L. on him.

Methanol or Wood Alcohol As Denaturants

Editor: Chemical Industries.

The September issue of your journal refers to the recommendations of the Internal Revenue authorities in recommending the restoration of methanol as denaturant and the refusal of the Secretary of Treasury to approve it. The daily press quoted him as stating "he would authorize no poisons as denaturants." Probably he does not know that most denaturants are poison. Throughout, the word "methanol" is used and "wood alcohol" is not mentioned. The term methanol should be confined to the pure synthetic methyl alcohol now on the market and the term "wood alcohol" should be used where the product of wood distillation is to be designated.

Methanol has no value as denaturant except to kill the unsupecting user, while wood alcohol contains impurities such as acetone, acetate of methyl, aldehydes such as formaldehyde, methylals and oily impurities which have strong odor and tastes that are warning agents which are absent from pure methanol. The unsuspecting drinker of methanol would die without warning.

Throughout the writer's experience of forty years with manufacture of wood alcohol no instances of death without warning from wood alcohol drinking were encountered while the drinking of pure methanol during prohibition caused many deaths, while the absence of taste and odors differing from ethyl alcohol allowed the unsuspecting death of the drinkers who in most cases were tramps who thought they could drink anything alcoholic.

We hope that the value of wood alcohol as denaturant as compared with methanol may be impressed on the authorities.

H. O. CHUTE.

New York, Sept. 22, 1934.

Cyanamid Output

Germany now holds an outstanding position in the world's output of cyanamid and of a total world productive capacity of cyanamid of 534,000 metric tons N, around one-third or 180,000 tons N is in Germany. Before the war Germany's cyanamid capacity amounted to only 10,000 tons but rose sharply during the war to 100,000 tons in 1918, to record still further appreciable expansion in the post-war period, and in 1933 German cyanamid works had a total capacity of 180,000 tons N. World consumption amounted to 178,014 tons in 1932-1933, compared with 144,668 tons in 1931-1332 and 217,-935 tons in 1929-30. Germany has relatively the largest cyanamid consumption of any country.—*Chemical Age.*

Half a Century of Paint Technique

By R. M. Reed

President, Western Dry Color Co.

MY talk will be on "Progress in Colors since the Columbian Exposition, Chicago's former World's Fair." At that time, while quite a few chemical colors were made in this country by Ansbacher, Harrison Brothers and a few others, we were looking to Europe to supply the majority of our best quality colors. In those days we used Italian ochres and siennas, English, French and German orange mineral and red lead; and as far as the intermediate and dyestuff business was concerned, Germany, Switzerland and others had practically all our business.

Some progress in the manufacture of colors was gradually made up to the time of the World War. Heller & Merz made ultramarine blue. Some of the white lead manufacturers improved their red lead and orange mineral, so that we ceased to use the old French Tours orange mineral and Imperial orange mineral and used the domestic brand.

In those days the biggest step forward was made in reds. In the nineties, eosine vermilions and basic chromate of lead were about the only reds we had. An eosine struck on an orange mineral gave excellent body and brilliancy, but very poor permanency. There was always great danger of livering if mixed in varnish. We also made basic chromate of lead, or American vermilion. This color was permanent but was extremely heavy and very difficult to grind and was a very dull shade.

About 1897 the para reds were introduced, at first in reduced colors only and later in toners. Most toners, however, were hard and not as strong or brilliant as at present, but they did not liver in varnish and had pretty good permanency. The intermediates from which para reds were made—paranitraniline and beta naphthol—came from Germany. Large quantities of para reds were used in those days especially for agricultural machinery. A little later, lithol red and toluidines were introduced, and the consumption of all these reds has gradually increased as they are superior in almost every way to the old eosine vermilions.

Then came the war, and almost all of you know of the hectic time we had the first year or two endeavoring to obtain colors. We had depended on foreign sources for so many of our raw materials that for about six months after we had run out of our supply of colors, a very unusual condition existed. However, gradually we commenced to supply our own intermediates and other raw materials until at the present time I would estimate we produce more than 90% of what we use.

Since the war, our chief progress has been: first, to improve the quality of the colors we have always made. Second, to produce new types of permanent colors, chiefly the phospho-tungstate type.

All the colors, such as chrome yellow, chrome green, etc., are stronger, softer and more permanent than formerly. They also are much more uniform. This condition has been brought about by improved testing methods and intense competition. The ultra violet lamp, or Fade-ometer has been a great help. It is now possible to make a light test on a batch of color in the Fade-ometer in a few hours. Formerly, this would have taken weeks in summer and several months in winter. This insures much quicker progress in bringing out new permanent colors.

The phospho-tungstate molybdate colors were originally made in Germany. The Chemical Foundation acquired these patents for this country. Since then many variations and improved methods have been introduced.

In the pre-war days we usually made lake colors by precipitating acid dyes with barium chloride, calcium chloride, or some similar salt. We also made lakes from basic dyes, which as a rule were brighter and stronger than the acid dyes. These basic dyes include Malachite green, brillian green crystals and Victoria blue, and others. They were precipitated with tannic acid and made very brilliant lakes, but faded very badly. On the other hand, a green tungstate toner will stand light very well indeed. Of course, exposure in the Fade-ometer is not the same as outdoor exposure, but, in most instances, we figure eighty hours to be about the same as a year's exposure outside in this latitude. Greens, blues, reds and yellows of this tungstate molybdate type may be obtained. We find the greens and reds to be the most permanent.

For a great many years the chief demand made by the paint trade to the color manufacturers has been, "Why do you not give us a green or a blue that does not change in the can when reduced to a tint?" For thirty years we had no answer to this complaint. We now find that in most all vehicles these phospho-tungstate colors stand very well in the can, even when reduced to an exceedingly delicate tint. Of course, there are objections to every color. The tungstate colors are soluble in lacquers. They are not quite permanent enough when reduced to light tints to stand out-doors, and they spot to some extent when around sinks where washing powder is used. However, they are very acid proof and exceedingly brilliant, and we believe they will come to be used to a great extent when their good qualities are thoroughly appreciated. At the present time many manufacturers use them for inside paints, and according to many, they are giving very good satisfaction.

Recently there has been national legislation regarding lead-free paint on toys. These tungstate colors and hansa yellow, which is a toluidine struck on aceto-acetanalide, are very suitable for toy enamels, and are lead-free. The tungstate and molybdate manufacturers inform us that there are no toxic qualities in these substances.

Why Colors Fade

As I understand the most accepted theory of color: they first divide the spectrum into complimentary colors—yellow and violet, orange and blue, and red and green. When all these are absorbed we get a black. When all are reflected, a white. When the red waves, for example, are absorbed, you see the complimentary color—green, the theory being that the yellow and violet and the orange and blue waves neutralize each other. Now if you get a complete absorption of all the red waves and no absorption of any of the other colors, you obtain a very bright green. Partial absorption of any of the other colors, of course, would affect the brightness of the green.

You ask just how are we supposed to know that this occurs. This can be proved by measuring what light waves are absorbed and what waves are reflected. Fading of the color depends on so many things that it is a very complex subject. One of the most important things is the vehicle in which the color is mixed. A color may be very permanent in varnish and lacquer and fade quite readily in oil. However, you gentlemen probably know more about the proper vehicles to get permanency than I do. Light, especially in the presence of moisture, causes increased vibration of the electrons in the molecules of a color. This is apt to bring about reducing or oxidizing action. This may cause changes in the color which reduces or increases its ability to absorb light.

Taking this green, for example. On exposure, it turns a dirty blue. This could be caused by absorption of some orange light, which would release the complimentary color blue. If little of the blue is absorbed and most of the orange, a dirty blue would result. Of course, absorption of some yellow waves would release violet, which perhaps has also occurred to some extent. The more of all these rays that are absorbed the darker and blacker the color will turn. On the other hand, lack of absorption turns the green white. This is what we usually call fading. These changes in the ability of the color to absorb light may be the result of oxidizing or reducing action.

An iron blue tint will, of course, turn white on being subjected to a reducing agent, but will turn blue again on oxidation. A chrome yellow will turn darker and greenish in the presence of a reducing agent, and it would be hard to restore it to its original color by oxidation. How can we use this theory and make our colors more permanent? I do not know at present, but hope I will some day.

We know certain processes will produce more permanent colors than other processes. A chrome yellow, according to my experience, should be made quickly and in a rather cool solution. On the other hand, oranges are made hot and are more permanent than the lighter shades. Some chrome greens made hot are more permanent than those made cold. All of these different variations in process may have a good deal to do with the type of crystals formed in the color, and this in turn, no doubt, has a good deal to do with the permanency of the pigment. A thorough study of the relation of permanency to the crystal structure of pigments, would be very desirable. This, however, is a very big subject and would take a great deal of work.

World Phosphate Trade

A survey of the European phosphate market in 1933 is given in the annual report of the "Office Cherifien des Phosphates," the Morocco monopoly, which plays a leading part in the European production. For the first time in several years, the report is able to point out a perceptible recovery in the international market.

An increase in world consumption from 6,800,000 tons to 8,100,000 tons was registered last year. European consumption rose by 750,000 tons and consumption in the United States by 550,000. In Australia, Africa and Asia no changes of importance occurred. The increase in consumption is due partly to the slight improvement in agricultural business and partly to the fact that consumption has been stimulated by lower prices. As regards European countries, the increase in consumption was very irregular. While demand showed little change in Great Britain, France, Switzerland, Holland, Belgium, Spain and Portugal, an increase was witnessed in Germany (251,000 tons), Italy (214,000 tons), Poland, Latvia, and a few other countries.

Production was influenced mainly by the growth of the Russian industry. The increasing importance of the Russian production is shown by the fact that of 760,000 tons of phosphate produced in Europe last year, Russia's share was 676,000 tons. North African supplies increased in 1933 by 200,000 tons, to 3,400,000 tons, of which 1,648,000 tons (an increase of 48,000 tons) came from Tunis 570,000 tons (15,000 tons increase) from Algiers, 1,015,000 tons (127,000 tons increase) from Morocco, and 187,000 tons (6,000 tons increase) from Egypt.—*Chemical Age*, British.

An Open Letter

To the Chemical Manufacturers

From a Chemical Distributor

I HATE to have to write an anonymous letter, but I do not dare to sign this, although the facts I think you ought to understand from the point of view of the distributor are national, not personal, and I believe are absolutely agreed to by chemical jobbers all over the United States.

During the past two years, the recognized and established system for selling and delivering small lots of chemicals in local markets has gone to pot. At the bottom of this situation lies the smaller consumption of all sorts of chemicals which has very largely increased the seriousness of competition among producers of chemicals, who are anxious to maintain as large a tonnage of production as possible.

These are two facts which all in the chemical trade agree to.

The present situation, if it continues and is allowed to become permanent, is going to ruin the established chemical distributors, and I want to point out to you, just as strongly as I can, why this is so, and how such a result would seriously cripple the chemical industry in this country.

The break-down of our old chemical distributing system is not the fault of the present established chemical distributors. They are not at all responsible for the decline in the demand for chemicals. It cannot be shown that they have fallen down on the job of selling through laziness or carelessness. The system has not failed because local chemical sales territories have not been properly covered by present recognized jobbers.

The local market for chemical supplies in any section of the country is somewhat fixed. I do not mean that it does not ever change. New consumers do, from time to time, begin to buy. New uses for old chemicals are discovered, and new chemicals do open up new groups of customers.

Nevertheless, no one who knows anything about the sale of chemicals believes that any amount of sales effort put forward in Boston or in Los Angeles would very much increase consumption at these points of soda ash, trisodium phosphate or copper sulfate. Chemicals are not like soap or chewing gum, and beyond a reasonable limit, selling is like trying to batter down a stone wall with your fist. In other words, if two or three recognized chemical jobbers are covering a given territory with sufficient salesmen to call upon the regular chemical consumers and do a little constant, steady missionary work, doubling the number of these salesmen or doubling the number of distributing houses will not greatly increase the sale of chemicals in that territory. The point I want to make is, that the failure of the present established selling system cannot be laid at the doors of the established chemical jobbers, who maintain adequate stocks and adequate sales forces to properly cover their territories.

No, the blame must be laid at the door of the manufacturers who, in their eagerness to snatch any order, no matter how small, for any chemical, have stepped into well covered territories with new distributors. Naturally, these new distributors of chemicals are most of them ignorant of the sale and uses of chemical products. They have been gathered from everywhere —jobbers of laundry and washing machinery, manufacturers of brass polish and bedbug killers, garage owners, undertakers and truckmen; in fact, about the only place where you would not today expect to be able to buy chemical supplies is a delicatessen store or a "five and dime." In some instances these newly appointed chemical jobbers do know something about chemicals (chiefly disgruntled salesmen or chemists out of a job) but in every case, they create an excess selling force and necessitate the carrying of extra chemical stocks, with the result that there is price chiseling and the legitimate trade of the established distributor is not only disturbed but unnecessarily reduced.

Like the writer of this letter, we dislike anonymous communications, but he has set forth so clearly and temperately a critical problem which is certainly no secret in chemical circles, that we feel quite justified in putting his "argument for justice" before our readers.

As a jobber with many years' experience in the business and a sizable investment in warehouse, trucks, office and office equipment, I naturally "view with alarm" the big slices cut off our gross sales by these newcomers, and we have long considered seriously adding other lines to our business. We know other chemical jobbers who have gone into lubricating oils, miscellaneous industrial supplies, such as waste, laundry bags, dyeing nets, etc., and even household chemicals and janitors' supplies. We may be forced to extend our line in such directions as these and we don't doubt our ability to continue to make a living in our own territory; but we believe that this scattered effort would not be so good for our chemical business, and we hesitate to branch out. However, at this time, we are very much more concerned with the demoralization of the chemical trade by these newcomers than by the actual business which we have lost. A newcomer in any chemical field, as the manufacturers know very well, gets into the market by price cutting. These newcomers in the less car lot field not only unstabilize the price structure, but they introduce all sorts of bad practices on the extension of credit, the handling of returnable containers, proper charges for delivery in small lots, and special concessions on split orders affecting contract prices.

Breaking Down Markets

The net result is that the local less car lot markets of the country are broken down, the total sale of chemicals is not increased, and the business of the established legitimate distributor is badly cut into. I maintain that it is a "penny-wise and pound-foolish" policy on the part of the chemical producers to create and continue a situation of this sort.

I don't expect that even the most friendly of our own principals (and we have represented some chemical manufacturers in our territory many years) to lose any sleep over the details of the problems of their distributors, but since the established distributors of this country have for years faithfully and in the main efficiently served the chemical industry as selling agents, I do believe that as a group producers and distributors have a common interest, and that it is distinctly up to the chemical manufacturers as a group to foster—not to ruin—the business of the established chemical jobber.

Gist of the Distributors' Plea

Conditions as they exist today threaten our very business lives. They are completely beyond our control, but they are within the control of the manufacturers. This is not a plea for mercy, it is an argument for justice, founded upon the simple and selfish reasoning of the best interests of the chemical producers of the country themselves.

Lead and Zinc Pigments and Zinc Salts Production

To supply the mineral industry promptly with data on lead and zinc pigments and zinc salts production and markets during the past year, the following information is furnished by the United States Bureau of Mines.

Sales of all lead pigments and of all zinc pigments and salts registered important increases in 1933, the range being from 5 per cent. for litharge to 60 per cent. for leaded zinc oxide. All pigments and salts decreased sharply in 1932, following decreases in all pigments and salts, except leaded zinc oxide and zinc chloride, in 1931.

Increases in sales of lead pigments in comparison with 1932 were as follows: basic lead sulfate, 27 per cent; red lead, 16 per cent.; white lead (dry and in oil) and orange mineral, 9 per cent. each; and litharge, 5 per cent.

Sales of zinc pigments and salts in comparison with 1932 showed the following increases: leaded zinc oxide, 60 per cent.; zinc oxide, 36 per cent.; lithopone, 16 per cent.; zinc chloride, 3 7per cent, and zinc sulfate, 34 per cent.

The average values for all lead pigments, as reported by producers, showed improvement in 1933, while those for all zinc pigments were lower. Despite this showing sales of zinc pigments increased proportionately more than those of lead pigments.

Complete information and statistics on lead and zinc pigments and zinc salts in 1933 are given in the chapter on "Lead and Zinc Pigments and Zinc Salts" in the MINERALS YEARBOOK 1934, about to be issued by the United States Bureau of Mines.

Lead and zinc pigments and zinc salts sold by domestic manufacturers in the United States, 1932-33

	1932			1933		
		Value			Value	
	Short tons	Total	Per ton	Short tons	Total	Per ton
Basic lead sulfate or sublimed lead:						
White	5,708	$ 534,369	$94	7,320	$ 736,404	$101
Blue	549	34,125	62	625	65,525	105
Red lead	18,880	2,101,860	111	21,988	2,637,640	120
Orange mineral	212	37,691	178	231	45,928	199
Litharge	58,096	5,155,555	89	61,193	6,197,124	101
White lead:						
Dry	19,946	2,329,876	117	24,628	2,763,630	112
In oil[1]	46,728	8,939,422	191	48,354	8,372,689	173
Zinc oxide	72,250	7,956,697	110	98,542	10,379,937	105
Leaded zinc oxide	14,305	1,296,076	91	22,868	2,011,761	88
Lithopone	121,667	10,176,856	84	140,831	11,751,500	83
Zinc Chloride, 50° Baume	23,524	1,033,255	44	32,187	1,459,745	45
Zinc sulfate	4,252	138,476	33	5,698	221,780	39
[1]Weight of white lead only but value of paste.						2063

Sales of some lead and zinc pigments, by uses, 1932-1933

	1932 Short tons	1933 Short tons		1932 Short tons	1933 Short tons
White lead (dry and in oil)			*Basic lead sulfate*		
Paints	63,399	68,368	Rubber	3,955	5,078
Ceramics	1,761	1,617	Other	6,646	10,286
Other	1,514	2,997		121,667	140,831
	66,674	72,982	Paints	5,689	7,072
Red Lead			Storage batteries	195	99
Storage batteries	10,655	12,949	Rubber	77	161
Paints	6,389	7,182	Other	296	613
Ceramics	467	715		6,257	7,945
Other	1,369	1,142	*Litharge*		
	18,880	21,988	Storage batteries	29,365	27,327
Orange mineral			Insecticides	11,735	11,126
Color pigments	108	96	Oil refining	4,793	6,070
Ink manufacture	58	18	Ceramics	2,963	5,438
Other	46	117	Chrome pigments	2,591	3,973
	212	231	Rubber	1,921	2,875
Lithopone			Varnish	1,360	610
Paint, varnish and lacquers	93,465	106,995	Linoleum	169	106
Floor coverings and textiles	17,601	18,472	Other	3,199	3,668
				58,096	61,193

Lithophone producers report an annual production capacity of 233,000 tons.

Imports of lead pigments are negligible. Exports of white lead dropped from 1,681 tons in 1932 to 1,048 tons in 1933, while exports of red lead increased from 498 to 570 tons, and of litharge increased from 1,493 to 1,538 tons.

Shellac:

Natural, Artificial, Substituted and Synthetic

By Ibert Mellan, M. Sc.

LAC, that essential substance in the formation of natural shellac, native to India, Assam, Burma, Indo-China, and Siam, is a dried resinous exudate from the lac insect [tacchardia lacca] getting its name from the Sanskrit [laksha] which means a "hundred thousand" and which obviously refers to these myriads of lac insects that settle and feed on the young twigs of the host trees. This dried exudate or lac is in reality but a protective coating against unfavorable climatic conditions and natural enemies and the resinous formation produced by these insects can be compared to the making of honey by the bees.

Stick-lac is the name of these lac incrusted twigs broken into short pieces. When crushed, washed and dried they are known as Seed-lac or Grain-lac. In the wash water is a lac-dye that can be obtained by sedimentation. Many years ago this lac-dye was extensively used as a substitute for Cochineal, but with the advent of synthetic dyes, has lost its market value.

Shellac as viewed commercially is made from Seed-lac and a determined quantity of orpiment or rosin. This is put into bags, and held over a charcoal fire until the lac fuses and runs through the cloth. The filtered shellac is remelted, pulled into sheets, broken into flakes, then packed for shipment. Imperfections are removed to be worked over and sold as an inferior grade of shellac.

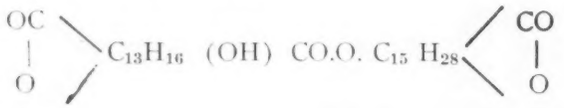
Refuse-lac, a resin remaining in these bags, is recovered by extracting with alcohol or dilute soda solution, then removing either the alcohol by distillation or the soda solution by the addition of an acid. This recovered lac is fused again and poured upon a metal slab then becoming Garnet-shellac. In its pure form it is rosin free, but, as found on the market, contains 8-10 per cent. of rosin, is dark purple-red in color, and is marketed as A. C. Garnet. Cruder grades are black in color, contain 18 per cent. of rosin, and are known as Kala and Gal Garnet.

Button-lac, as the name indicates, is round disks of shellac made by the same process used in the manufacture of flake shellac, differing not only in the final step when disks are formed instead of flakes, but in the previously essential selection of superior stick-lac of finer color.

Bleached shellac is made by treating an alkaline solution of shellac, seed-lac, or stick-lac with sodium hypochlorite, a treatment which destroys the natural coloring matter found in lac. Following this, the lac is precipitated, fused, and flaked. Refined bleached shellac is the wax-free form of bleached shellac. The considerations in the grading of shellac are the color, transparency, flatness, strength of flakes and freedom of adulteration. Some of the more important grades found on the market are known as D. C. [David Campbell]; V. S. O. [very superior orange]; Superfine; T. N.; Fine; Standard One, Two and Three.

While lac is classified as a resin, it stands apart from all other resins in chemical composition. When shellac is extracted with water, this aqueous extract contains glucose, fructose, laccaic acid [$C_{20}H_{14}O_{14}$] and albuminoid matter. When this same shellac is then extracted with cold alcohol, the alcoholic solution will contain aleuritic acid, tri-hydroxy-palmitic acid, and mono- and di-hydroxy-palmitic acids which are present as lactones in the lac. That portion which is insoluble in cold alcohol consists of a mixture of waxes, myristic esters of melissic, palmitic and cerotic acids. Tschirch's analysis shows that stick-lac contains about 6.0% of wax, 6.5% of coloring matter, 74.5% of resin, 3.5% of water, and 9.5% of residue. Benedikt and also Enderman [*J. Franklin Inst.* 164, 283 and *Bull. Soc. Chim.* 1909, 5, 859] believe that the wax is composed of myricyl and ceryl alcohol, free and combined with oxy acids and fatty acids. The resin portion of shellac was divided, by them, into an ether soluble fraction [35%] and an ether insoluble fraction [65%]. In the ether soluble part Tschirch finds principally fatty acids, wax-like substances with a lac odor, a resin-like body and a dye. Gupta [*J. Ind. Inst. Sci.* 1924, 7, part VIII, 1924] finds the ether-soluble constituents to be myricyl alcohol, a mixture of palmitic and myristic acids, an unsaturated mono-hydroxy-acid [$C_{15}H_{28}(OH)COOH$], Tschirch's erythrolaccin [orange-red needle]. The ether-insoluble portion con-

sisted of a resinotannol ester of aleuritinic acid. Analysis shows that 75% of shellac is made of a mixture of aleuritic and shellolic acids. Some consider aleuritic to be di-hydroxy-palmitic acid [*Chem. Umschau* 1922, 39, 135]. W. Nagel thinks that aleuritic acid as present in shellac is a tri-hydroxy-palmitic acid whose structure is [$HOCH_2$ $(CH_2)_5$ [CH $(OH]_2$ $(CH_2)_7$–COOH]. This acid upon oxidation with 3% $KMnO_4$ in ice yielded azeloic acid and a syrupy HO acid with seven carbon atoms. Nagel reduced aleuritic acid with hydriodic acid and phosphorus and obtained palmitic acid. Endermann isolated a shellac acid with the structure of [Me. CH(OH) $(CH_2)_3$ [CH(OH)]$_2$ $(CH_2)_8$. COOH]. This acid on oxidation with potassium permanganate gave sebacic acid and caprolactone. Harris and Nagel, [*Ber.* 55B, 3822, 1922 and *Chem. Centr. Bl.* 1924, II, 1187], postulated that shellac is an ester linkage of the lactide type, based upon the fact that they isolated aleuritic acid [$HOCH_2$ $(CH_2)_5$ CHOH, CHOH $(CH_2)_7$ COOH] and shellolic acid $C_{13}H_{16}$ $(OH)_2$ $(COOH)_2$ from the saponified product. They also synthesized resins similar to shellac by heating these acids under reduced pressure. This product, like true shellac, upon heating is changed into an insoluble and infusible resin. The authors therefore feel justified in believing that shellac is formed by lactide condensation of various complex hydroxycarboxylic acids, while the researches of others indicate that the shellac molecule is built up of HO acids joined together in lactone couplings.



Whitmore, Weinberger, with Gardner [*Ind. & Eng. Chem. Anal. Ed.* 4, 48-51, 1932] consider shellac to be an ester condensation product in which the ester linkage represents the elimination of water from the hydroxyl group of one constituent hydroxy-acid and the carboxyl group of another. They also believe that shellac contains several ester types such as lactides, lactones, anhydrides and intra-esters.

Recently, another type of shellac has been introduced, called "Loko," which is white Madagascar shellac. This material is produced by the insects, Carteria lacca Signoret, Tachardia lacc R. Bl, Coccus lacca Ken. Chemical analysis shows it to consist of

Resin (true shellac)	67.2%
Wax ceryl formate and oleate	12.0%
Polymerized material	14.1%
Vegetable and mineral matter	7.0%

The specific gravity of shellac at 60/60° F. lies between 1.08 and 1.13. This range is due to inclosed air bubbles. It begins to soften at about 40° C. and gradually becomes liquid as the temperature rises. Decomposition starts, however, if shellac is heated much above 100° C. Shellac is soluble (with the exception of the natural wax and mineral matter) in cold methyl, ethyl, isopropyl, and amyl alcohols, and solutions of sodium carbonate, sodium bicarbonate, borax, ammonia-water, and trisodium phosphate. Like soap, an alkaline solution of shellac may be precipitated by salting out. Caustic soda alters shellac chemically. It is insoluble in dilute mineral acids, petroleum hydrocarbons, turpentine, and benzine. Shellac on atmospheric exposure loses its moisture and becomes partially insoluble in alcohol. The average percentage insoluble in alcohol ranges 1.75% to 3%.

Solubility of Lac (Shellac) C. Coffignier

Bull. Soc. Chim. 7, 1049-54

	Stick-Lac	*Shellac*	*Bleached Shellac*
D_{16}	1.009	1.036	1.0
Softens	65°	60°	55°
Melts	120°	115°	115°
Acid Number	34.7	62.4	80.6
Koettstorfer Number	173.9	204.8	235.6
Percentage Insoluble in Solvents			
Ethyl Alcohol	11.7	7.0	3.6
Methyl Alcohol	7.7	6.6	4.6
Amyl Alcohol	3.8	3.3	1.4
Ether	82.7	76.3	77.5
Chloroform	76.3	66.1	67.2
Benzene	82.8	80.0	79.7
Acetone	44.3	37.7	19.0
Turpentine	88.8	86.2	90.9
Benzaldehyde	4.5	1.6	0.0
Aniline	2.2	0.0	0.0
Amyl Acetate	17.0	6.6	1.7
Carbon Tetrachloride	88.0	93.2	90.1

Because shellac is a mixture and all of its chemical constituents are as yet unknown, it is a formidable problem which has as yet not been solved. Much time and effort has been spent in creating substitutes, but the resulting substitutes are far from perfect. Many, however, show astonishing similarity to natural shellac in their solubility, and are marketed under various names. Some of the better known are Daccoin, Novolak, Abalak, Sibolite, Metakolin, Issolin, Wacker shellac, Syntellae, Buckeronium, and Albertol shellac. These have practically the same solubility in various solvents as natural shellac. Some types are only soluble in borax, but most of them are insoluble in hydrocarbons and are unaffected by mineral oils. Many of the shellac substitutes when applied as a coating are resistant to water, acids, ammonia, and other weak alkalies. They range from colorless to yellow or brown in color. Some are very hard and have melting points up to 150° C. Although these varnish solutions have high spreading power which yield coatings of high lustre they are, nevertheless, under the disadvantage of not having the same elasticity as that possessed by the varnish solution made from natural shellac. However, the excellent qualities of some of the shellac substitutes, together with their capacity to mix with pigments, render these products valuable materials for the varnish industry. Years ago, when an investigator attempted to synthesize shellac, his first step would be to alter the physical properties of natural resin. The changes were accomplished by combining resin or rosin with oil, or oxidizing and chlorinating resins and rosin, or separating certain portions from natural resins. Recently workers have turned their attention to the making of artificial and shellac substitutes by condensing phenols and alde-

hydes. More specifically phenol has been condensed with starch, sulfur chloride, and aldehydes. Other types were made by uniting tartaric acid with formaldehyde, and chlorinated toluene has been made to react with itself or with xylene to form a resin. J. Scheiber and W. Noach [U. S. P. 1,660,094, A New Type of Shellac Substitute] believe that they have synthesized true shellac, based on the fact that this resin is a mixture of aleuritinic acid and shellolic acid. The structure of the latter is unknown, except that it is an oxycarboxylic acid of a hydroaromatic nature. As proof, they refer to the work of Harris and Nagel who synthesized a shellac-like resin by heating a mixture of the above mentioned acids obtained from natural shellac. These inventors combined oxycarboxylic acids of an aliphatic nature with oxycarboxylic acids of a hydroaromatic character and obtained a resin which possessed a lactide group analogous to shellac. Too, the physical behavior towards solvents were like those of shellac and artificial ones can replace the natural for every particular use. To make this resin 30 parts of linseed oil acids and 30 parts of soft Manila copal are dissolved in 500 parts of water, with the aid of sufficient alkali. Then 30 parts of potassium permanganate dissolved in 1000 parts of water are added. When oxidation is complete, the manganese dioxide is filtered off and the resin precipitated by means of acid, then washed. The product of the reaction is dried and heated to a temperature of 150° C. until it becomes a resinous mass which quickly solidifies upon cooling.

Shellac Substitutes

Substitute for Shellac, C. L. Lightenhome, U. S. P. 1,315,137. To make shellac 25 lbs. of tallow are melted with 75 lbs. of Manila, Kauri, or Copal gum, then heated for two hours at 300° F. To this mixture is added 400 lbs. of colophony, the heat maintained for about 1 hour at 400° F. The addition of rosin diminishes the strength of the finished article and may be omitted. Now a specially prepared flat or gloss drier is added to the extent of 2-5%. After the drier is thoroughly incorporated, 25 lbs. of casein is then added, first dissolved in alkali. This molten mass is then poured upon rollers, and rolled into thin sheets and flaked. The shellac substitute is soluble in alkali and alcohol. The gloss drier is calcium nitrate; the flat drier, calcium chloride.

Process of Preparing Substitutes for Shellac. Jacob Meyer. U. S. P. 898,382, 1908. This consists of dissolving an alcohol soluble resin-like Copal, Sandarac, or Accroides in an aqueous solution of an alkali. The resinous acids are precipitated with an acid and mixed with saturated fatty acids such as palmitic and stearic. The alcoholic solution of this mixture will yield a polish just as durable as shellac. An example of the process is as follows: 60 lbs. of Manila Copal or Sandarac or Accroides are dissolved in 27 lbs. of 33% potassium hydroxide (an equivalent amount of sodium hydroxide or sodium carbonate may be used). This solution is filtered and to it is added a hot solution containing 2 lbs. of stearin, 2 lbs. of potassium hydroxide and 20 lbs. water. After complete solution sulfuric acid is added and to insure complete precipitation the whole mass is heated to 70° C. The precipitate is then filtered off, washed and dried. The resin is soluble in alcohol, borax and alkali. When used as a polish it gives a glossy film.

Waterproof Varnish

Waterproof Varnish. R. E. Dings and L. Shuster. U. S. P. 1,326,917. The invention deals with a waterproof, quick-drying varnish suitable as a substitute for shellac to be used either as a varnish or wood filler. The following formula gave the best results: Manila gum (alcohol soluble) 200 lbs., alcohol 40 gals., Carnauba wax 100 ozs., spirits of turpentine 4 gals.

Shellac Surrogate and Process of Producing the Same. J. R. Köhler. U. S. P. 1,327,332. Six hundred kg. ground natural resin-like rosin are mixed with 750 kg. of oil of turpentine in the cold and stirred for four hours. The solution is filtered off and the residue washed with oil of turpentine. The residual matter which weighs 220 kg. is the shellac substitute. It is soluble in spirit and can be used for making polish or varnish.

Varnish-gum and Producing the Same. J. J. Kessler. U. S. P. 992,596, 1909. A varnish material with properties similar to shellac is made by dissolving rosin, Kauri, Manila gum in a solvent unaffected by nitric acid such as naphtha. This solution is now subjected to the oxidizing effect of nitric acid (1.4 sp. gr.). If oxidization does not begin with the addition of nitric acid external heat is applied. When the reaction is complete, the mass is removed from the liquid, washed free of acid and dried. Like shellac this material is soluble in alcohol, the varnish dries quickly, is insoluble in petroleum oils, and may be varnished over with an oil varnish without softening.

"Pine resin shellac. An essay on the chemistry of wood products." Assion Aschan. *Pulp. Paper Mag. Can.* 22, 641, 649, 653-4, 1934. A fine resin "shellac" is obtained from preferably old pine resin that is first distilled to remove the turpentine, then the abietic acid is extracted from the residue with turpentine, finally extracting the residue with alcohol. The shellac obtained from the alcoholic solution is yellowish in color and has a molecular weight of $C_{20}H_{20}O_5$. It is a monobasic acid; free from resin acids; more soluble in sodium hydroxide than in sodium carbonate solutions, soluble in borax solution, ethyl alcohol, acetone, ethyl and methyl acetate; insoluble in petroleum ether and benzine. It resists bleaching, does not esterify with glycerin, or vulcanize with sulfur.

Substitute for Shellac. Carl Ludwig. U. S. P. 760, 541, 1904. A shellac substitute for the purpose of polishing is made by dissolving 56 parts of a resin-like Manila Copal, Sandarac or the like in 150 parts of a

hot 6% solution of potassium hydroxide then adding 2-3% of oleic acid. When solution is complete it is cooled and filtered. Then acid is added to precipitate the newly formed product, which is now washed and dried.

Shellac-like Products

Shellac-like product. British Patent 350,764, 1929. W. Dux. A product that will harden with the application of heat, suitable for use in varnish, insulating, impregnating and binder, is prepared by combining Copal resin with polyhydroxy fatty acids such as trihydroxystearic acid and others.

Brit. P. 11,090, 1906. Products similar to shellac are made by chlorinated resins or their derivatives in alkaline solution. The chlorine-containing products are then precipitated with an acid. They are soluble in alcohol.

U. S. P. 1,927,472. J. Scheiber. Unsaturated fatty acids such as linseed oil are first chlorinated, then heated to 150° C. until the halogen group is split off. A shellac-like product is formed.

Brit. P. 300,956, 1927, Ger. P. 504,828, 1927. W. Dux makes a shellac substitute by heating a halogen derivative of unsaturated aliphatic or hydro-aromatic acids such as abietic acid, linseed oil acid, resinic acid or of the aleuritinic or shellolic acid type wth a similar halogenated compound or with a suitable hydroxycarboxylic acid such as trihydroxystearic, hydro-aromatic carboxylic acid, etc.

German P. 187,844 1906. A shellac substitute is made by subjecting Copals, amber and the like to oxidation by sodium hypochlorite.

German P. 220,585, 1909. When the residue of the refining of crude cotton oil is oxidized by means of lye a shellac substitute is produced.

German P. 198,845, 1905. Manila Copal, Sandarac or other alcohol soluble resins are mixed in a pulverized state with 1-5% of fatty oil and heated until the mixture thickens.

German P. 209,217, 1906; 206,447, 1906. Olein, palmitic, stearic acids, ceresin, castor oil and other alcohol soluble oils, waxes and mineral substances are mixed with alcohol solution of Copal resin to prepare shellac substitute.

German P. 207,549, 1907. Shellac substitutes are obtained by treating colophony, Sandarac and Elemi with small amounts of aldehydes with or without condensation agents.

German P. 234,502, 1908. Fatty or wax-like masses especially for the preparation of varnish, lac, etc., by heating crude or neutral wool-fat or the so-called wool-fat acids, exposed to action of air, with basic agent for a long time at a high temperature without the application of high pressure. Oxidation can be completed at ordinary temperature by the addition of oxidizing substances.

Brit. P. 4,546, 1908. A shellac substitute is prepared by first mixing an alcoholic solution of a pitch resin with a fatty acid, then saponifying the mixture and finally precipitating the material out of solution.

Brit. P. 120,719, 1918. Rosin is first subjected to oxidation and amorphous material extracted. The alcohol soluble material is similar to shellac.

Process for the Preparation of Elastic Products and Substitute for Natural Lacs. G. Nuth, U. S. P. 1,159,258. A substitute for natural lac is obtained by the action of primary, secondary or tertiary amines upon "factices"—the reaction product of a fatty body and protohalogen compound of sulfur. The fatty body used may be any one of the drying, semi-drying, or non-drying oils. The amines may be a substance of the fatty or aromatic series that will give up an amine group readily. One way to form factice is to mix and stir a solution of 10 parts of linseed oil in 40 parts of toluene with 3 parts of sulfur dichloride in 15 parts of toluene. A gelatinous transparent mass separates out of the toluene. Now this separated linseed oil factice is heated with three times its weight of aniline at 125° C. for 5 hours. This solution is now poured into ten parts of toluene and filtered. The filtrate is mixed with alcohol to precipitate the new product. This new substance is gelatinous, soluble in benzol, leaves an adherent film and hardens rapidly in air. There are a number of other examples given in which other fatty oils are used in place of linseed oil, and other amine-containing substances are used in place of aniline. Also stronger ammonia water, ammonia carbonate, and urea are used.

Process for Betulin

Process of Making Betulin. J. R. Köhler. U. S. P. 1,016,162. Betulin is heated under reduced pressure (20-30 mm.) in the presence of an inert gas at a temperature of 350°-370° C. for a period of four hours. The resulting product has a melting point of about 140° C.; it is soluble in linseed oil, turpentine and acetone.

Artificial Shellac. Brit. P. 221,205, 1923. Ammonia or organic bases are mixed with natural or artificial alcohol soluble resins such as gum Benzoin, Sandarac, phenol-sulfur resins, phenol-formaldehyde, ketone-formaldehyde, polymerized lactic or glycolic resins, resinous oxidation products of toluene, toluene sulfamide resins, waxes, and esters.

Lacs from Derivatives of Cellulose. Lehmann and Stocker. U. S. P. 1,185,514. This process gives a substitute for lac which flows like oil, is bright, dries uniformly, is elastic and air- and light-proof. Made by dissolving 10 gms. of cumarone in 50 gms. of benzol. To this solution is added a solution of 30 gms. of collodion in 5 gms. of acetone oil, 100 gms. of alcohol, and 100 gms. of ketones. The resulting mass is diluted with 100 gms. of alcohol, 300 gms. benzine and 100 gms. methyl alcohol.

Swed. P. 53,760, 1923. Oxidized amorphous resin acids are mixed with cellulose esters.

Substitute for Shellac and the Like. M. T. Harvey. U. S. P. 1,725,793. This invention relates to a shellac substitute made from oil extracted from the shell of Cashew nut. Nine pounds of this oil are heated with one pound of cupric carbonate for one hour at 140° C. The resulting liquid is separated from the solid matter and made into a varnish or lacquer by dissolving in benzol, naphtha, or alcohol.

Manufacture of Substances from Rosin Oils. Armand Müller-Jacobs. U. S. P. 631,749, 1899. A shellac substitute and a lubricating oil can be made by treating rosin oil with sulfuric acid. Thirty to fifty parts of sulfuric acid (66° Bé) are slowly added to 100 parts of rosin oil with constant stirring. When the mixture reaches a temperature of 50° C. 300 parts of cold water are added, stirring until a homogeneous mixture is produced. Mixture is then allowed to stand until the uncombined acid separates and is drained off. Next a dilute solution of an alkali is added to the oily liquid until a clear solution is obtained. When this solution is boiled with water, an oily liquid separates out and is removed. Now a salt of an alkaline earth is added to the remaining solution until a gum is precipitated which is soluble in alcohol and can be used as a substitute for shellac.

"Condensation of Benzyl Chloride in the Presence of Chlorides of Metals." S. N. Ushako and A. V. Kon. *Zhur. Prikladnoi Khimii* 3, 69-79, 1930; *Chemical Abstracts,* 1930, page 3796; Ger. P. 280,595 and 416,904. Shellac substitute is obtained by condensing benzyl chloride (B. P. 177-180° C.) with chlorinated para-xylene (B. P. 199-202° C.) in the presence of ferric chloride, zinc chloride, aluminum chloride, etc. The resinous products obtained have a melting point ranging from 70°-100° C. They are stable in light and soluble in benzene and alcohol. When toluene is chlorinated [P. Krishnsmurtly Brit. P. 298,939, 1927] in the presence of zinc sulfate, there is formed benzyl chloride and a yellow liquid. This substance, when washed and dried at 260° C., is changed into a solid which can be used as a shellac substitute.

Artificial Shellac

Blumer obtains an artificial shellac [*Rev. Gin. Chim.* 22, 28, 1905] by condensing 155 kg. tartaric acid with 150 kg. formaldehyde (40%) by gentle heat, then adding 190 kg. of phenol. When the reaction ceases, the oily substance is washed with hot water then with cold. The resin hardens into white flakes like natural lac. If desirable, 290 kg. of alpha-naphthol may replace the phenol in the formula.

"Synthetic Resin." J. McIntosh, U. S. P. 1,679,322. This patent deals with a shellac substitute which can replace the natural product for molding and impregnating purposes. It also has non-conducting properties. To make this product 100 lbs. of oil of cassia are mixed with 200 lbs. of phenol and 5 lbs. of sulfuric acid or hydrochloric acid as a catalyzer. This mixture is heated in a reflux condenser for one hour. The excess phenol is removed by distillation under vacuum. The resulting product is a shiny black resin which can be used as a shellac substitute.

Shellac Substitute, Ger. P. 237,743, 1908, is made by cooking together phenol and starch having been treated with dilute nitric acid. The resulting product is then thickened by the addition of stearin, resin, formaldehyde and mineral acids. [U. S. P. 1,753,030].

Shellac substitute. C. Ellis and T. V. Meigs. U. S. P. 1,756,819. A resinous product, which can be used as a shellac substitute, was produced by emulsifying 500 lbs. of cresol [98% tar acids] with 2500 lbs. of water containing 300 lbs. of crushed ice. Then 675 lbs. of sulfur monochloride are added. The sulfur chloride reacts with the cresol forming a yellow resin and hydrogen chloride which dissolves in the water. The precipitated resin is purified by kneading it in hot water or water containing sodium carbonate, then drying at 70° C. The resin is soluble in alcohol, acetone, partly soluble in cold caustic soda and completely in hot caustic.

Acid-Resistant Shellac Substitute. J. R. Kuhn, U. S. P. 1,564,002. This artificial substance is made by reacting meta and para cresol with 1½ times its weight of sulfur chloride in the presence of benzene. After the reaction is completed, the solution is blown with heated air at 150° C. to deodorize it. Then the benzene is recovered. For use as an artificial shellac it is dissolved in alcohol and a small amount of phosphoric acid is added to change the color of the alcoholic solution to yellow. An alcoholic solution of this resin containing 4 lbs. to the gallon will leave a small amount of sediment after several days of standing, which should be removed prior to use. The alcoholic solution resembles orange shellac and leaves a film which is acid-resistant and can be sandpapered or rubbed down.

Another type of artificial shellac, Brit. P. 221,205, 1923, is made by taking 1000 parts of sulfur-phenol-resin (containing 20% of sulfur) and mixing it with 15 parts of cyclohexylamine and 200 parts of formaldehyde. This mixture is heated until all of the moisture is driven off. Then the following are added, 20 parts beeswax, 15 parts cyclohexylamine, 10 parts formaldehyde and 50 parts of water.

Brit. P. 220,985, 1923, deals with another type of shellac substitute, made by reacting a phenol with a methylene group. For example: 6.8 molecular weights of phenol are mixed with 6 molecular weights methylene chloride. This mixture is heated to 120° C. in the presence of ammonia. Other examples are:

I. 5 cc. phenol
5.5 cc. concentrated ammonia water
2.5 cc. methylene chloride

II. 9 mols. phenol
16 mols. concentrated ammonia water
16 mols. methylene chloride

Formulae for the making of phenol-resins water insoluble by sulfonation can be found in *Farbe & Lack,* 1927, page 286. Other references are Brit. P. 186,107, 1921; U. S. P. 1,435,801.

Shellac Substitute. U. S. P. 1,857,691. This invention relates especially to a shellac substitute useful as a size, binder, and coating material for paper, textiles, etc. This product is made by first condensing one molecular weight of phenol with one molecular weight of formaldehyde with the aid of an acid or alkali catalyst. When a liquid soluble and fusible resin is obtained, four parts of this resin are emulsified with 5 parts of casein solution. The casein sloution is made from 100 parts of casein, 600 parts of water, and 10 parts borax.

New Resin-like Product. C. Gentsch. U. S. P. 924,-449. Made by condensing 100 parts ortho-cresol with 70 parts 40% formaldehyde in 60 parts water with the aid of 5 parts concentrated hydrochloric acid. Mixture is stirred and heated at 100° C. for several hours. The resin formed is soluble in alkalies, methyl alcohol, ethyl alcohol, acetone, chloroform, but is insoluble in oil of turpentine, fatty oils and acids. When applied as a varnish, it will leave a brilliant and odorless coating.

German P. 210,012, 1907, made by condensing phenol with cyclic ether [made from glycerin and an aldehyde]. The thick oil is separated from the water and dried at 100°-150° C. Upon cooling a transparent resin is obtained which has the same solubility as shellac.

Shellac substitute. J. E. Harrison. Australia P. 14,531, 1928. Artificial shellac or synthetic varnish is obtained by treating phenol, or cresylic acid or oils containing them with formaldehyde and a catalyst.

Brit. P. 266,358, 1926. Condensing an aryl amine (aniline, toluidine, naphthylamine) with formaldehyde.

Dan. P. 24,697, 1919. A shellac substitute made from phenols and aldehydes in the presence of chlorinated hydrocarbons.

German P. 217,560, 1908. Shellac substitute made by treating resin-like phenol formaldehyde condensation products with oxidizing agents.

Shellac Substitute. Brit. P. 182,497, 1921. Diazo compounds are incorporated in mixture of phenol-formaldehyde or a ketone-formaldeyhde before condensation. Resulting resins are oil-soluble and can be used as dyestuff or shellac substitute.

Shellac Substitute. Ger. P. 234,744, 1910. Phenol and formaldehyde are condensed with the aid of an acid and the reaction interrupted by the addition of a salt of hyposulfurous acid.

Shellac-like Product. U. S. P. 1,770,875-6. A. W Burwell. This process deals with the making of shellac-like products by the oxidation of petroleum hydrocarbons with the formation of saponifiable, water-insoluble, petroleum-insoluble hydroxy-carboxylic acid. Fuel oil distillate [40°-36° Bé] containing 0.1% of a catalyst, such as manganese oleate, is heated to 135°-140° C. and at a pressure of 250 lbs. per sq. in. While these conditions are maintained, air is pumped through the mass. When the reaction is complete, the mass separates into three layers. The intermediate layer consists essentially of hydroxy-carboxylic acids. This is separated from the remaining liquid, washed with water, and subjected to vacuum distillation. The resulting shellac-like product is amber to dark brown in color, soluble in alkali solutions and in chloroform.

Protein from Tea-extract Residue. Japan P. 36,787. 37.5 kg. of tea are extracted with 27 liters of water at 75° C. for 6 hours. To the aqueous solution is added 2.6 kg. of sodium hydroxide, and the mixture heated to 100° C. for 1 hour. Upon the addition of an acid, brownish scales are separated which can be used as a shellac substitute.

Ger. P. 220,582, 1909. The residue from the refining of crude cottonseed oil is subjected to alkaline oxidation. The mass is then washed with water and finally extracted with a solvent. The residue is a resin-like mass similar to shellac.

Holland P. 3,351, 1919. Organic vinyl esters are polymerized by the action of light or heat and with or without a catalyst.

Shellac Substitute. Brit. P. 314,399, 1928. Aldehyde resins are fused with polymerization products such as polymerized vinyl compounds, acrylic esters and itaconic acid esters. These can be used in place of shellac as a binder.

Uses

Shellac and its substitutes are used very extensively in the industries both in their dry and varnish form. When used as a binder, these products are employed in the manufacture of buttons, emery wheels, imitation ivory, phonograph records, poker chips, sealing wax, insulation, and mica products. They are further used in the making of hats, oil-cloth, linoleum, fireworks, and paper. As a varnish, these products are employed for their quickdrying qualities, and are applied upon floors, furniture, interior decoration, musical instruments, and toys. One of the largest uses of natural shellac is as a vehicle in anti-corrosive and anti-fouling paints.

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CHEMICAL

The Photographic Record

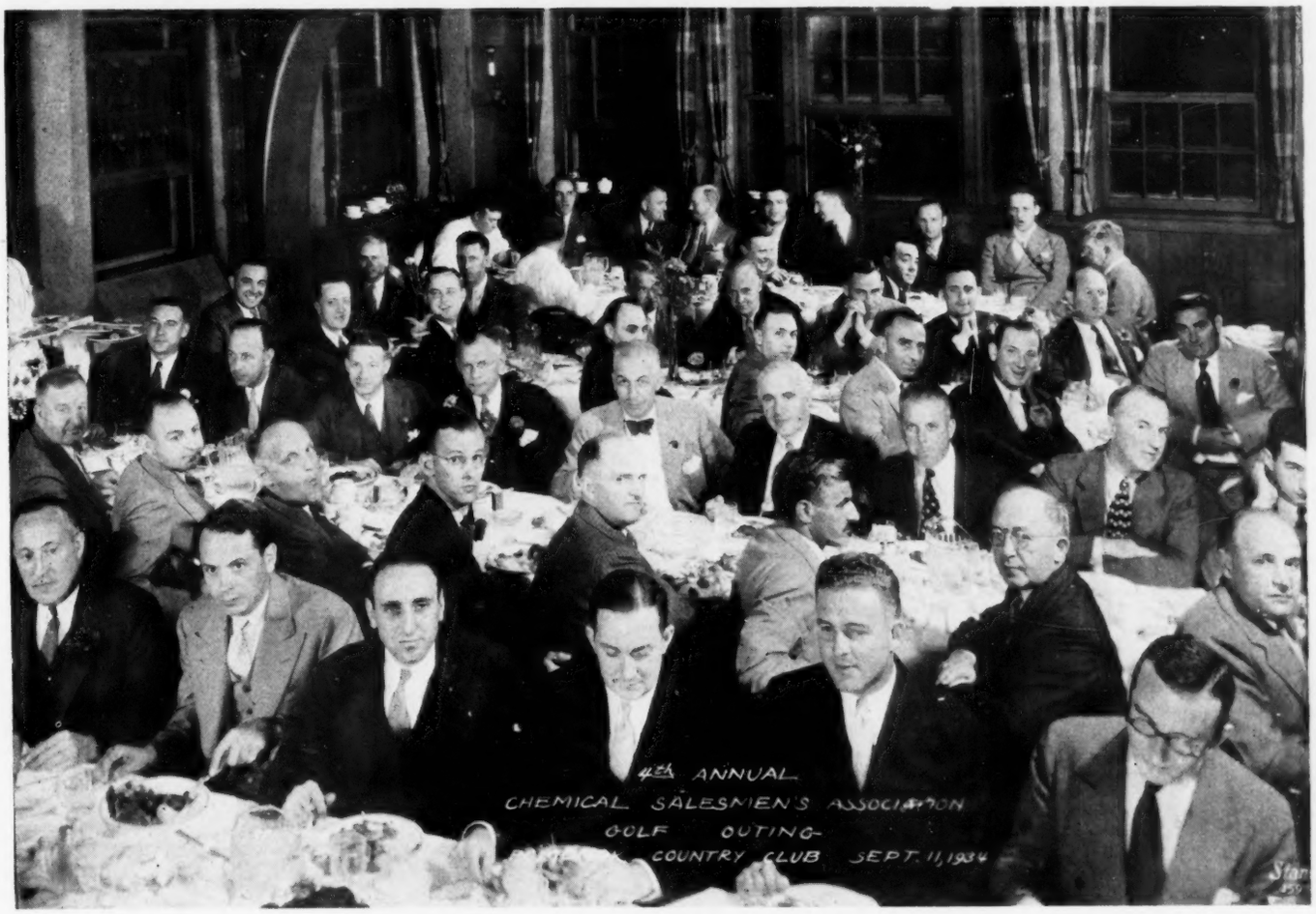
Two striking views of the famous Searles Lake, in California, where the American Potash & Chemical Corp., having become in the past ten years important factors in borax and potash, are adding carbonate and just completing their new refinery, which will turn out potassium muriate better than 99 per cent. pure.

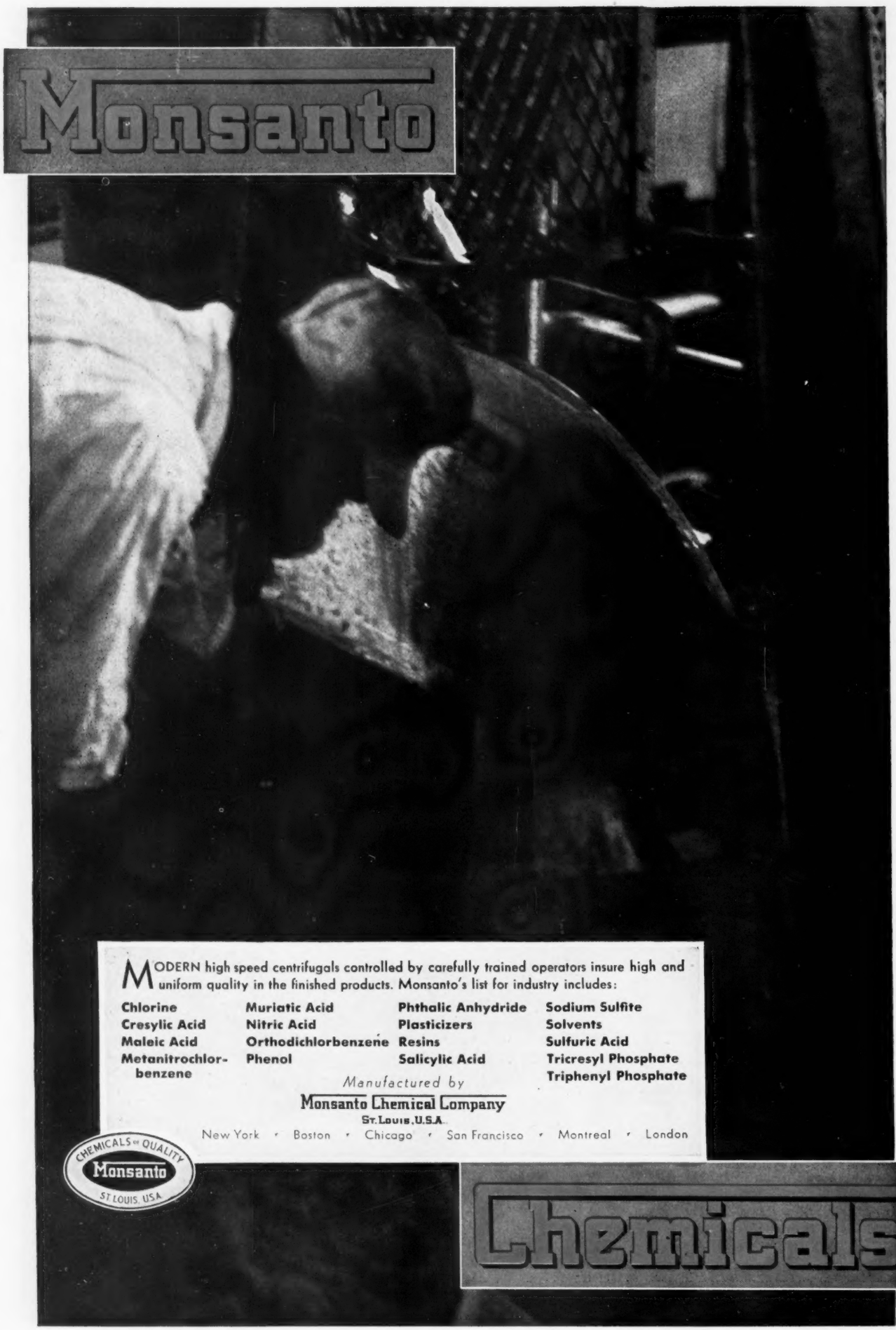
Vegetable Growers' Association of America, Inc., following their annual meeting in Toronto, were guests of the American Cyanamid Company, after which they inspected the huge nitrogen fixation plant at Niagara Falls, Canada.

NEWS REEL

of Our Chemical Activities

The fourth and last golf tournament of the season is voted the best by the members and guests of the Salesmen's Association. Pomonok Country Club, on the North Shore of Long Island, provided all the necessities for a perfect day and an even more perfect evening. It just must have been good—five guests became members on the spot.

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Use of Rosin in Soap Manufacture

By Archibald Campbell

Rosin has been an important constituent of soaps in the United States for many years, and, though it has been replaced to a considerable extent by other fats and oils, is still extensively used in many grades of American household soaps.

Common rosin at temperatures below 60° F. is a hard, brittle, vitreous solid, while at higher temperatures it becomes tacky, sticky, and somewhat plastic. The composition is variously given as abietic acid with some abietic anhydride and other rosin acids, and as a mixture of rosin acids.

Gum rosin is prepared from the distillation of crude gum, and wood rosin is obtained by extraction from pine tree stumps and waste pine wood by the use of solvents. Both types of rosin always contain varying amounts of non-saponifiable substances, probably derived from the raw materials and also formed by decomposition due to heating during the process of refining and processing.

To the writer's knowledge, wood rosin has not been extensively used by soap manufacturers up to the present time. Experience shows that it does not make a soap of as good quality as that derived from gum rosin.

Gum rosin is insoluble in water and, like the fatty acids, is freely soluble in alcohol. It is graded according to color. The grades are designated by the letters of the alphabet beginning with the darkest and extending to the palest. The grades from G to N are principally used in the soap industry. These grades, especially G and M rosins, seem to produce somewhat harder soaps than the paler grades WG and WW.

Gum rosin reacts readily with caustic alkalies, carbonated alkalies, and oxides of the heavy metals to form soaps. The rosin soaps of the heavy metals are semi-solid, tacky substances that find extensive use in the manufacture of lubricants.

Rosin soaps of the alkali are very soft, viscous, sticky, and tacky, and have the characteristic aromatic, piney odor of gum rosin; they are freely soluble in water, produce a free copious lather, and have pronounced detergent properties. They are used in the production of hard and soft soaps, never by themselves but always in combination with other fats and oils. Soda soaps of pure rosin do not become hard enough to be used as commercial hard soaps; potash soaps of pure rosin do not acquire the necessary consistency and firmness to be used as commercial soft soaps.

Rosin soaps do not rinse freely or completely; they leave the washed articles with a tacky feel and a rosin odor, indicating non-saponifiable materials, and/or hydrolysis of rosin soap, or both. These tacky, sticky substances being insoluble in water, have a marked tendency to adhere to the washed fabrics and to resist the action of rinsing, thus destroying the fluffiness and softness of garments and rendering them hard and ropy. This is very objectionable, especially in the case of rayons, silks, and woolens. For this reason rosin cannot be used in the manufacture of textile soaps or for soaps intended for use in either power laundries or domestic washing machines.

The incorporation of rosin in hard laundry soaps imparts to them a characteristic rosin odor, yellow color, and tough, waxy texture which tends to overcome and prevent cracking and breaking when processed in the cake or bar form. It also tends to slow up or prevent the crystallization of the soaps of the harder fatty acids and to render them softer and more readily soluble in laundry practice. For this same reason rosin cannot be used in the production of chipped, flaked, shredded, granulated, or powdered soaps. By preventing crystallization, rosin retards drying and interferes with the process of manufacture of this large and important part of the soap industry. It is evident, therefore, that in the field of hard soaps, rosin is restricted to use in the production of household soaps in bar or cake form.

Potash rosin soaps are extensively used in the production of various kinds of smooth and artificial fig soaps. Rosin imparts to these soaps a clear, waxy appearance and consistency considered essential to a high-grade product.

Owing to its low cost and free lathering properties, rosin was formerly extensively used and considered an essential constituent in the manufacture of household laundry soaps in combination with tallow, greases, and palm oils. At that time soaps made from these hard fats were hard, brittle, and deficient in lathering and sudsing properties, owing to their slow solubility in warm water. Rosin served the many-fold purpose of reducing the cost, improving the solubility in warm water and hence the free lathering properties, and of reducing the hardness and thereby improving the texture of the soaps and rendering them less brittle and of a more waxy and tough consistency. It also improved the color and, by imparting some of its piney odor to the soaps, served to cover up the oftentimes disagreeable smell of the hard fats. The

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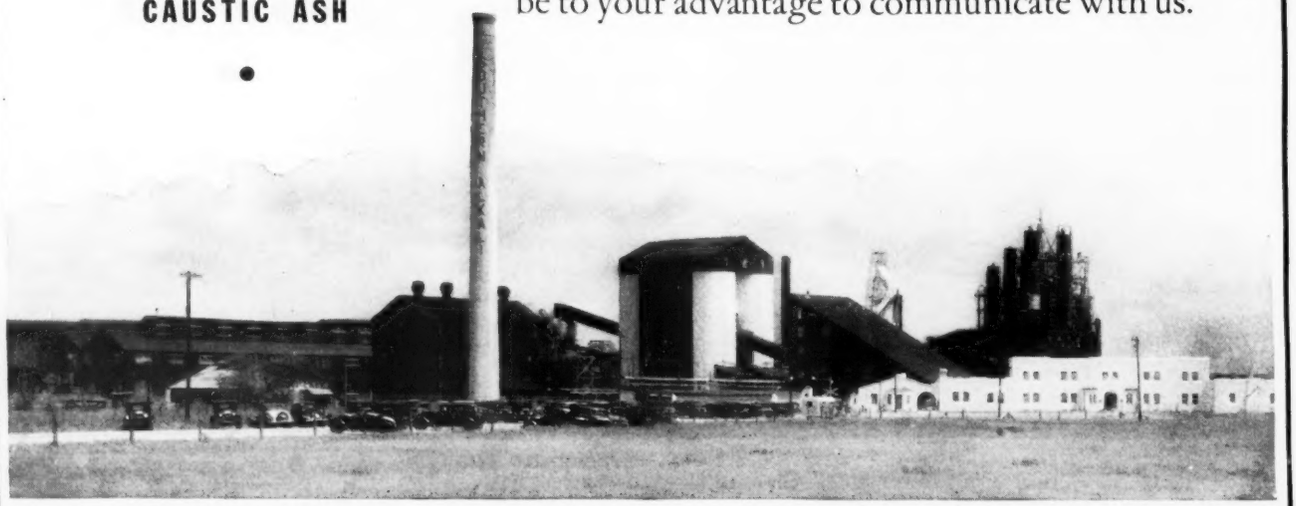

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rosin in these hard soaps is at times as high as 60 per cent. of the total fatty acid content of the soap, depending on the hardness of the fats used.—*Abstracted from Soap Gazette and Perfumer.*

Rubber

Latex Adhesives

Two recent processes are given in the following: In U. S. P. 1,967,639 the rubber particles of a latex dispersion are protected against coagulation under ordinary conditions of handling and shipping by a composition consisting of a casein-formaldehyde condensation product and a tannic acid salt, deposited on the rubber particles, insufficient in amount to prevent the rubber deposited from the latex from exhibiting essentially its normal adhesive characteristics.

U. S. P. 1,967,336 gives an adhesive composition comprising non-acid latex free from ammonia or formaldehyde, and containing hexamethylenetetramine from the reaction of formaldehyde and ammonia in the latex, and a stabilizer from the group consisting of Nekal and sodium hydroxide.

Patents—Rubber

Process making hard rubber bonded abrasive articles. No. 1,969,497. Raymond C. Benner, Niagara Falls, N. Y., to The Carborundum Co., Niagara Falls, N. Y.

Preservation rubber by treatment with the added product of a phenol containing at least two discrete rings and an amine. No. 1,968,914. Waldo L. Semon, Silver Lake Village, Ohio, to B. F. Goodrich Co., New York, N. Y.

Method of making rubber articles. No. 1,968,887. Merrill E. Hansen, Akron, Ohio, to American Anode, Inc., Akron, Ohio.

Method of preparing electrical insulation by intimately admixing with natural rubber an alkaline reagent. No. 1,968,883. Wm. C. Geer, New Rochelle, N. Y., to B. F. Goodrich Co., New York, N. Y.

Method for road surfacing composition comprising precipitating rubber composition from an aqueous dispersion in a finely divided precipitate. No. 1,970,470. Edw. Arthur Murphy, Erdington, Birmingham, England, to Dunlop Rubber Co., Ltd., Erdington, Birmingham, England.

Manufacture rubber from cold moldable powders. No. 1,970,469. Edw. Arthur Murphy, Erdington, Birmingham, England, to Dunlop Rubber Co., Ltd., Erdington, Birmingham, England.

Reclaiming vulcanized rubber by treatment with a hydrocarbon oil, containing aromatic constituents, obtained from cracking of petroleum, with an initial boiling point of 350° F. or higher. No. 1,971,746. Marcellus T. Flaxman, Los Angeles, Cal., to Union Oil Co., Los Angeles, Cal.

Process rubber preservation incorporating within unvulcanized natural rubber sulfur and 2.2'-dihydroxy-5.5'-dichlorodiphenylmethane; then vulcanizing. No. 1,970,972. Ludwig Orthner, Leverkusen-am-Rhine, and Max Bogemann and Theodor Weigel, Cologne-Mulheim, Germany, to I. G., Frankfort-am-Main, Germany.

Process vulcanization accelerator. No. 19,286. Ewald Zaucker and Max Bogemann, Cologne-Mulheim, and Ludwig Orthner, Leverkusen-I. G. Werk, Germany, to I. G. Frankfort-am-Main, Germany. Reissue.

Metals and Alloys

Copper and Copper Alloys

The ductility of electrolytic copper is greatly increased if it is smelted, melted and cast in absence of oxygen. The National Physical Laboratory found that the deleterious effects of traces of bismuth in fire-refined ("best selected") metal can be neutralized by the conjoint presence of oxygen and arsenic or antimony, respectively. It is not yet known whether similar results are practicable commercially. The difficulties of welding copper appear to have been surmounted by the use of properly deoxidized copper, coated electrodes having approximately the same melting point as copper, and proper manipulation. The improved arc welding process has been applied mainly in the construction of locomotive fire-boxes. The low price of copper has led to its use in place of other metals, *e.g.*, copper pipes have been used in place of iron and lead service pipes. Alloys of Cu containing 20-30 per cent. of nickel are being used in increasing quantities in spite of their relatively high cost, in warships and the larger mercantile fleets, for condenser tubes. The Durville method of casting has made possible the more extensive use of aluminum brass (Cu, 76 per cent.; Zn, 22 per cent.; Al, 2 per cent.) and of aluminum bronze. The latter has been improved in yield point, breaking stress and ductility by the addition of 4-7 per cent. of nickel. Nickel bronzes containing 5 per cent. nickel and 10 per cent. lead have been found to be satisfactory for high speed parts, working in contact with hard nitrided steel. An alloy containing copper 80 per cent., tin 10 per cent. and nickel 10 per cent. is useful for pump liners and slide valves. The addition of 2-2.5 per cent. Ni to high tensile brasses increases the ductility and resistance to erosion. In spite of the high price, beryllium (2-2.75 per cent.) alloys are now being used in Germany in the manufacture of springs, both spiral and laminated. Attempts to make use of brittle Cu alloys, notably 8 per cent. phosphor-copper, have met with a measure of success in Great Britain and Germany, while a copper-silicon alloy (3.4 per cent. Si) is in use as a substitute for gun metal and high-tensile brass.—*Chemical Age*, Met. Sect., 30, 15-16.

Metal Detergent

A compound useful in cleaning metallic surfaces given in U. S. P. 1,967,393, comprises approximately 4 parts of an alkali metal carbonate, 0.4 parts of a sulfonic acid derivative of an alkylated aromatic hydrocarbon, and 1 part of an organic solvent of the group consisting of amyl alcohol and cyclohexanol.

Alkaline Anti-Corrosive Treatment

Certain investigators have shown that alkaline treatments can be used to stop the attack of corrosive fluids on ferrous materials. Walter F. Rogers, in *The Petroleum Times*, points out that this has been most successful in the protection of city water mains through the development of a calcium-carbonate protective-scale layer. It has also been reported that alkaline treatments have been used with success to reduce corrosion of subsurface equipment in oil wells producing fluid containing hydrogen sulfide. A series of tests was run on three wells at Goose Creek, Texas and two wells in the Smackover, Arkansas pool to test the value of the treatment. These wells produced fluid of varying degrees of corrosivity, but were all free from hydrogen-sulfide gas. Test results were obtained by following the frequency of tubing failure before and during the treatment. The results were such as to show that no benefits were obtained by the use of the treatment. These conclusions apply only to the particular methods used for conducting the treatment, and do not condemn it in principle. The idea of depositing a protective layer of calcium carbonate on the well equipment has merit, and may be developed in the future as a worthwhile process for the protection of oil field equipment.

New Light Alloy

A new light alloy has been introduced by J. Stone & Co., to which they have given the name of "Ceralumin C." This contains copper 2.5, nickel 1.5, magnesium 0.8, iron 1.2, silicon 1.2 and cerium 0.15 per cent. and thus belongs to a well-known class of light alloys, but contains cerium in addition to the more usual elements. It is claimed that cerium refines the microstructure, and also suppresses the formation of the brittle iron-aluminum constituent.

Patents—Metals and Ores

Process ferrous alloy containing chromium, silver and iron. No. 1,969,705. Ralph P. De Vries, Menands, N. Y.

Process for high electro-conductive copper alloy. No. 1,969,702. Donald K. Crampton, Marion, and John J. Vreeland, Waterbury, Conn.

Process for treatment of zinc sulfide ores. No. 1,969,567. Fred Eric Lee, Trail, B. C., Canada, to Consolidated Mining & Smelting Co. of Canada, Ltd., Montreal, Can.

Electrolyte for deposition copper and copper alloys, by a solution of a soluble thiosulfate and pure cuprous chloride. No. 1,969,553. Donald Gernes, Minneapolis, Minn.

Method of reducing metals from oxidized materials. No. 1,969,264. Wheadon M. Grant, Birmingham, Ala.

Process for making colloidal solutions of metals and metallic compounds in polyalcohols, resulting in colloidal solution of metallic silver in glycerin. No. 1,969,166. Carl Hermann von Hoesse, Radebeul-Dresden, Germany, to Chemische Fabrik von Heyden, A. G., Radebeul, near Dresden, Germany.

Production silver alloy from silver, zinc, tin, and nickel. No. 1,969,019. Robert H. Leach, Fairfield, Conn., to Handy & Harman, New York, N. Y.

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Production silver alloy from silver, cadmium, tin, and nickel. No. 1,969,018. Robert H. Leach, Fairfield, Conn., to Handy & Harman, New York, N. Y.

Flux for welding magnesium and its alloys, of barium and lithium fluorides, and a mixture of sodium and potassium chlorides. No. 1,968,984. Wm. O. Binder, Midland, Mich., to Dow Chemical Co., Midland, Mich.

Production high speed steel. No. 1,968,966. Jos. Kent Smith, Detroit, Mich., to Beryllium Corp., New York, N. Y.

Oven for production tin oxide. No. 1,968,933. Ernst Feldmann, Cologne-Deutz, Germany.

A soldering flux comprised of boric acid, borax and ammonium chloride, together with a liquid from the group consisting of water and hydrogen peroxide. No. 1,968,841. Anthony J. Maffia, Brooklyn, N. Y.

Process ore flotation; subjecting ore to a froth flotation operation in presence of a frothing agent and a xanthate containing an ether grouping and containing no free OH groups, as a promoting agent. No. 1,970,508. Ludwig J. Christmann, Jersey City, and David W. Jayne, Jr., Elizabeth, N. J., to American Cyanamid Co., New York, N. Y.

Process for working up ferro-vanadium containing slags. No. 1,970,467. Eugen Mayr, Lautawerk, Lausitz, Germany, to Otavi Minen-und Eisenbahngesellschaft, Berlin, Germany.

Process for manufacture homogeneous tarnish-resisting silver-tin alloy. No. 1,970,319. Edw. F. Kern, New York, N. Y., to American Metal Co., Ltd., New York, N. Y.

Process for manufacture homogeneous tarnish-resisting silver-tin alloy. No. 1,970,318. Edw. F. Kern, New York, N. Y., to American Metal Co., Ltd., New York, N. Y.

Method of polishing metals by means of a scavenging solution, containing sodium carbonate and ammonium formate. No. 1,970,268. Arthur E. Bellis, Branford, Conn.

Process for production of age-resisting iron and steel. No. 1,970,067. Carl Wallmann, Fritz Halbrock and Emil Kumpmann, Mulheim-am-Ruhr, Germany.

Inhibitor for metal pickling baths. No. 1,971,736. Deal H. Tompkins, Nitro, W. Va., to Rubber Service Laboratories Co., Akron, O.

Method chloridizing ore metal sulfides. No. 1,971,573. Thos A. Mitchell, Denver, Colo., to Hughes-Mitchell Processes, Inc., Denver, Colo.

Process recovery alumina from aluminous silicious materials. No. 1,971,354. Alfred W. Scheidt, Sewaren, N. J., and Roy C. Folger, Cleveland, Ohio, to Electric Smelting & Aluminum Co., Cleveland, Ohio.

Colored aluminum; coating with solution of an alkali carbonate and a soluble dichromate, impregnating this coating with a soluble salt of permanganic acid. No. 1,971,240. Martin Tosterud, Arnold, Pa., to Aluminum Co. of America, Pittsburgh, Pa.

Method purification molten metal, treating copper or alloys in molten state with copper cyanide. No. 1,971,149. Wm. F. Zimmerli, Niagara Falls, N. Y., to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Preparation ore for reduction by coating surfaces of its particles with a film of a hydrated alkaline earth metal oxide. No. 1,971,112. Chas. G. Maier, Berkeley, Cal., to Thos. B. Swift, Martinez, Cal.

Method coating a filament with oxide. No. 1,971,076. Erwin F. Lowry, Wilkinsburg, Pa., to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Process purifying mercury used as cathode in electrolyzing processes. No. 1,970,974. Knut Wilhelm Palmaer, Stockholm, and Oskar Emanuel Griep, Appelviken, Sweden, said Griep assignor to said Palmaer.

Process electrode position platinum metals. No. 1,970,950. Edmund M. Wise, Westfield, N. J., to International Nickel Co., Inc., New York, N. Y.

Process and composition for treating metals. No. 1,970,852. Earle Atherton Harding and Donald Aubrey Holt, Niagara Falls, N. Y., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Concentration ores by flotation. No. 1,970,808. Wm. T. MacDonald, Copper Cliff, Ont., Canada, to International Nickel Co. of Canada, Ltd., Copper Cliff, Ont., Canada.

Alloy. No. 1,970,768. Hector Rabezzana, Flint, and Ora S. Duffendack, Ann Arbor, Mich., to General Motors Corp., Detroit, Mich.

Process electroplating bronze using solution of soluble tin and soluble copper compounds. No. 1,970,549. Harrison M. Batten, Toledo, and Carl J. Welcome, Maumee, Ohio, to City Auto Stamping Co., Toledo, O.

Process for metal finish being 10-25% tin and balance substantially copper. No. 1,970,548. Harrison M. Batten, Highland Park, and Carl J. Welcome, Lansing, Mich., to City Auto Stamping Co., Toledo, Ohio.

Plastics

Ingredient for Plastic Molding

A research note from the Director of the Indian Lac Research Institute outlines a by-product of shellac manufacture, known as Kiri, the lac of which product can be readily recovered and used for plastic molding purposes.

Hat Mold

Hat manufacturers are using a mixture of resin and aluminum powder for the manufacture of new forms, instead of metal. The powder transmits more easily the heat necessary to bring the block of resin into its proper plasticity and gives it a greater stiffness when cooled.—*Aluminum News-Letter.*

Patents—Resins

Phenol-formaldehyde resin. No. 1,969,292. Erich Asser, Wandsbek, Germany.

Preparation resinous materials by reacting on a polyhydric alcohol with a polybasic acid in the presence of an inorganic acid body containing replaceable hydrogen. No. 1,970,510. Carleton Ellis, Montclair, N. J., to Ellis-Foster Co., New Jersey.

Condensation product from hydroaromatic ring ketones. No. 1,969,850. Ernest Korten, Fechenheim, near Frankfort-am-Main, Germany, to General Aniline Works, Inc., New York, N. Y.

Method producing complex resinous condensation products by heating a polyhydric alcohol, a carboxylic organic acid, a weak polybasic inorganic acid, and an acidic phenol-aldehyde resin. No. 1,969,761. Israel Rosenblum, Jackson Heights, N. Y.

Process preparing resinous products characterized by solubility in fatty oils; heating a substantially completely polymerized phenol-aldehyde condensation product with a phenol having more than one nucleus. No. 1,971,507. Fritz Seebach, Erkner, near Berlin, Germany, to Bakelite Gesellschaft mit beschrankter Haftung, Berlin, Germany.

Process preparation resinous condensation products by reacting an anhydride of an organic polybasic acid with a urea, converting resulting product with an aldehyde into a resin. No. 1,971,476. Fritz Bitterich, Berlin-Schoneberg, Germany, to Bakelite Corp., New York, N. Y.

Oil-soluble resin. No. 1,970,912. Kenneth M. Irey, New Brunswick, N. J., to Resinox Corp., New York, N. Y.

Process for odorless phenol-formaldehyde resin. No. 1,970,649. Earl S. Edwards, Pennington, N. J., to Panelyte Corp., Trenton, N. J.

Patents—Coatings

Coating composition of organic derivative of cellulose and a triphenyl compound. No. 1,969,473 Thos F. Murray, Jr., Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Process accelerating rate of drying auto-oxidizable coating compositions using a polyvalent metal salt of an ether acid. No. 1,969,709. Herman A. Bruson, Germantown, and Otto Stein, Drexel Hill, Pa., to Resinous Products & Chem. Co., Phila., Pa.

Method of making printed cellophane by applying printing powder over the design. No. 1,969,569. Francis X. Malocsay, Upper Saddle River, N. J., to Consolidated International Corp., New York.

Manufacture transparent sheets or coatings. No. 1,968,991. Forest H. Clickner, Chicago, Ill., to Kraft-Phenix Corp., Chicago, Ill.

Process of coating magnesium articles. No. 1,968,922. Robert T. Wood, Cleveland, Ohio, to Magnesium Development Corp., Delaware.

Method increasing uniformity of transparency of glassine paper. No. 1,970,227. Leroy D. Frisbie, Russell, Mass., to Westfield River Paper Co., Inc., Russell, Mass.

Process coating artificial leather using mixture nitrocellulose, castor oil, camphor, lamp black and alcohol. No. 1,971,398. Alfons Fausten, Leipzig, Germany, to I. G., Frankfort-am-Main, Germany.

Method obtaining grained wood. No. 1,971,067. Chas. J. Fess, Maplewood, N. J., to Flood & Conklin Co., Newark, N. J.

Coating composition of rubber, cellulose nitrate, solvent medium; and as a plasticizer, an ester. No. 1,970,704. Wm. Samuel Melvin, Newburgh, N. Y., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Agricultural Chemicals

Recovery of Phosphate from Fines

A method of recovering phosphate from fines is described in U. S. Patent No. 1,973,439. Fines are mixed with oil, the oil-treated phosphates move under water to cause relative movement of the particles in such a way that the silicious constituents are separated and then removed.

Cattle Foods

Two new cattle foods, one looking like a plug of tobacco, the other like Boston brown bread, both offering aid for stock feeding in drought, were announced today by Guy Leonard.

The plug is made of molasses and cottonseed meal; the Boston brown bread of molasses and corn meal. Both use a new scientific principle for mixing molasses, which has been for many years a cattle fattening food, but difficult to handle because of its stickiness.

Absorption of Manganese by Plants

A survey of the manganese content of leaves from a number of land plants from natural soils of different *p*H values is given in a paper by Carsten Olsen (*C. R. Trav. Lab. Carlsberg*, 20 (2), 1-34; 1934), and shows that increase in soil acidity is accompanied by increased absorption of manganese, due presumably to the increased concentration of soluble manganese salts in the soil solution. Plants from basic soils show a very small manganese content. Iron content, on the other hand, seems to bear no consistent relationship to hydrogen ion concentration. Similar results were obtained with artificial soils in pot experiments with barley and buckwheat. Plants grown in water cultures of different *p*H but constant manganous sulfate concentration show a maximum manganese absorption at *p*H 6-7. Absorption increases with increase of manganese concentration in the medium. Manganese is probably absorbed as manganous ion, manganous salts being stable in acid soil.

Tobacco Waste for High Quality Insecticides

A method and apparatus for isolating pure nicotine solution in high concentration (50 to 80%) from waste tobacco has been developed at the University of Bucharest by R. Hofmann, who utilizes a novel adsorptive agent in the shape of the carbonized tobacco plants themselves.

Ammonia-Lime Fertilizer

Technique for production of "ammonia-lime" fertilizer has been finally perfected by Essener Steinkohlen Bergwerke, Essen, Germany, following many difficulties. Process, developed by the Society for Coal Technique in Dortmund-Eving, starts with ammonium bicarbonate. This salt is produced by a method so developed as to yield a pure-white and technically pure product. Under the research bureau's patented process, this product in solution is combined with sodium chloride by the aid of an intermediate salt, whereupon sodium bicarbonate is precipitated. Upon cooling of the salt solution, additional sodium chloride is added, precipitating ammonium chloride. Previously filtered sodium bicarbonate is dissolved, solution heated so that carbon dioxide is separated out to be used again for fixing ammonia. Remaining soda solution is converted to caustic soda lye by milk of lime. After filtering off calcium carbonate, this lye is then evaporated to suitable strength for use as a benzol wash. Ammonium chloride separated from the mother lye in second precipitation is dried, centrifugated and combined with ground carbonate, thus producing ammonia-lime.

Patents—Agricultural Chemicals

Process production fertilizers; obtaining sulfur at same time by acting on ammoniumthiosulfate with certain amount of acid. No. 1,969,650. Walter Klempt and Fritz Brodkorb, Dortmund-Eving, Germany, to Gesellschaft fur Kohlentechnik m. b. H., Dortmund-Eving, Germany.

Process treating alunite for recovery alumina and potash. No. 1,971,319. Harry G. Waldman, Westmount, Que., Canada, one-half to Carl H. Fowler, New York, N. Y.

Nitrophosphates of extraordinary low water content. No. 1,971,111. Emil Luscher and Samuel Ruosch, Basel, Switzerland.

Process for producing a fertilizer from raw phosphate by mixture with ammonium or potassium trinitrate in solid state. No. 1,970,372. Stefan Julius Gelhaar, Ljungaverk, Sweden, to Stockholms Superfosfat Fabriks Aktiebolag, Stockholm, Sweden.

Process for continuous treatment of vegetables with soda and gaseous chlorine for industrial production of cellulose. No. 1,970,148. Umberto Pomilio, Naples, Italy, to Alessandro Pomilio, Francavilla al Mare, Italy.

Treatment seeds by mixing a foam forming material and liquid to form a foam with an insecticidal substance. No. 1,970,163. Ernst Brandus, Berlin, Germany, to N. V. Noord-West Orion Handel Maatschappi j, Amsterdam, Netherlands.

Process for improving condition of ammonium salt for fertilizer, by adding anhydrous calcium sulfate. No. 1,969,980. Edw. W. Harvey, New Brunswick, N. J., to The Barrett Co., New York, N. Y.

Seed immunizing medium. No. 1,969,857. Wilhelm Schepss, Wilhelm Bonrath, and Karl Taube., Leverkusen, Germany, to Winthrop Chem. Co., Inc., New York, N. Y.

Leather

Waterproof Finish for Leather

This is accomplished by incorporation of an aqueous emulsion of a long chain aliphatic alcohol, containing 10 or more carbon atoms, with an alkaline shellac solution, to form a composite emulsion. Cetyl alcohol, and the alcohol from lauric acid, are specified, and emulsifying agents such as triethanolamine, casein, glue and gum may be added, together with dyes and other pigments. As examples:—(1) An emulsion is made from cetyl alcohol, stearic acid, triethanolamine and water, and an ammoniacal solution of shellac is added. (2) An emulsion is made from cetyl alcohol, stearic acid and an ammoniacal casein solution, and to this are added turkey red oil, a diazo dye, titanium white and an ammoniacal solution of shellac. Spec. No. 32134 of Imperial Chemical Industries, Ltd. *The Chemical Age*, August 25, p. 177.

Tanning Hides

A patent granted to Max Bergmann, Dresden, Germany, relates to a process of tanning or dressing hides by means of iron containing tanning materials. The main feature is that the hides, after being prepared in the ordinary way, are treated first with a tanning agent containing iron in combined form obtained by the treatment of albuminoid substances in the presence of iron salts with acids and substances exercising oxidizing properties, or with oxidizing acids. The iron-tanned leather thus obtained is further dressed with the aid of another mineral tanning material, such as chrome-, aluminum- or similar product

Patents—Tanning

Process and preparation waterproofing and tanning composition, by boiling sulfur with water, thereafter with linseed oil. No. 1,969,701. Frank Berdolt, Walden, N. Y., assignor of one-half to Minnie E. Berdolt, Albany, N. Y.

Process tanning hides with a solution obtained by treatment of albuminoid substances with acids. No. 1,970,271. Max Bergmann, Dresden, Germany.

Textiles

Month's New Dyes

Three new stabilized azoic dyestuffs by du Pont are Diagen Red AMX, Diagen Red AR, and Diagen Scarlet AR. These colors will find their principal use for printing large patterns economically on cotton and rayon dress goods and similar fabrics; and provide a range of brilliant reds and scarlets of excellent strength, and good, all-around fastness properties.

Monochrome Olive FBL, a new homogeneous chrome dyestuff, made by I. G., and marketed by General Dyestuff, is chiefly recommended for dyeing according to the monochrome method, but may also be used chrometopped. Produces bluish olive shades, and is especially recommended for dyeing of combination shades on loose wool and slubbing, all kinds of woolen and worsted yarns and piece goods.

A new Indanthren color, Khaki 2GA, in paste form, is being offered by General Aniline through General Dyestuff to take the place of the well known imported type. It possesses great tinctorial strength and excellent level dyeing properties, as well as excellent all around fastness. It is recommended for dyeing only and is especially suitable for the production of khaki shades in combination with Indanthren Brown BR, RAP or GAP, and with Indanthren Olive RAP.

Patents—Textiles

Manufacture dull lustre artificial filaments using an insoluble oxalate of titanium. No. 1,969,689. Thos. H. Byron, Elizabethton, Tenn., to North American Rayon Corp., New York, N. Y.

Method dyeing and printing acetate silk with a compound free from acid groups. No. 1,969,464. Karl Holzbach, Ludwigshafen-am-Rhine, and Guido von Rosenberg, Mannheim, Germany, to General Aniline Works, New York, N. Y.

Process artificial silk comprising filaments of cellulose acetate-propionate containing acetyl groups. No. 1,969,454. Hans T. Clarke, New York, and Carl J. Malm, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Process and apparatus for spinning artificial silk. No. 1,968,912. Hans Alwin Schrenk, Arnheim, Netherlands, to American Enka Corp., Enka, N. C.

Process for dyeing and printing textiles comprising treatment with mixture of an ice color coupling component and a diazoimino compound. No. 1,968,879. Miles Augustinus Dahlen, Wilmington, Del., and Frithjof Zwilgmeyer, Gordon Heights, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Process of treatment of textiles containing cellulose derivatives. No. 1,968,856. Geo. Rivat, Lyon, France, to Celanese Corp. of America, Delaware.

Method of dyeing textiles containing an organic derivative of cellulose. No. 1,968,855. Geo. Rivat, Lyon, France, to Celanese Corp. of America. Delaware.

Method of dyeing textiles containing organic derivatives of cellulose. No. 1,968,819. Camille Dreyfus, New York City.

Process for producing printed matte-effects on acetate silk by printing a paste thereon containing a swelling agent as a delustering accelerator. No. 1,970,522. Geo. Heberlein, Jr., and Albert Bodmer, Wattwil, Switzerland, to Heberlein Patent Corp., New York, N. Y.

Process making textile assistants by condensing an aliphatic unsaturated alcohol with an aromatic compound in presence of a sulfonating agent; then sulfonating. No. 1,970,353. Otto Albrecht, Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Apparatus for sampling. No. 1,970,597. Wm. J. Cotton, Buffalo, N. Y., to National Aniline & Chem. Co., Inc., New York, N. Y.

Apparatus for coating or filling textiles. No. 1,970,243. Albert Mellor and Ralph James Mann, Spondon, near Derby, England, to Celanese Corp. of America, Delaware.

Assistants for textile and related industries. No. 1,970,578. Conrad Schoeller and Max Wittwer, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Process and apparatus for treating artificial threads. No. 1,971,627. Hans Caesar Stuhlmann and Otto Weitermann, Premnitz, Germany, to I. G., Frankfort-am-Main, Germany.

Method and apparatus for loading silk containing fabrics, passing fabrics continuously through baths containing in succession a solution of an organic acid, tin tetrachloride solution, and alkali-metal phosphates. No. 1,970,736. Rene Clavel, Basel, Switzerland.

Process for making viscose. No. 19,280. Leon Lilienfeld, Vienna, Austria. Reissue.

Process for making viscose. No. 19,279. Leon Lilienfeld, Vienna, Austria. Reissue.

Pulp and Paper

Manufacture Cellulose

Experiments on chemical pulp and paper have been carried out by the Institute Du Pin of the University of Bordeaux with a view to increasing the yield in the manufacture of cellulose by the caustic soda process. A method was developed which permits the use of black liquid, without recovery, in the preparation of straw pulp of high quality with a yield which is much superior to that obtained by the soda process. (Consul Harold D. Finley, Bordeaux.)

Patents—Paper, Pulp, Cellulose

Manufacture pulp yarn or twine from wood cellulose. No. 1,969,095. Geo. A. Richter, Berlin, N. H., to Brown Co., Berlin, N. H.

Composition comprising cellulose acetate dissolved in a mixture consisting of propylene dichloride and at least one of the group of methyl and ethyl alcohols. No. 1,969,183. Ernest W. Reid, Pittsburgh, Pa., to Carbide & Carbon Chemicals Corp., New York, N. Y.

Treatment of cellulose esters by reducing viscosity characteristic of cellulose nitrate. No. 1,968,882. Roderick K. Eskew, Rahway, N. J., to du Pont Viscoloid Co., Wilmington, Del.

Dyestuff containing organic derivative of cellulose made by applying unsulfonated azo dyestuffs containing the tetrahydronaphthalene nucleus. No. 1,970,246. Henry Chas. Olpin, Spondon, near Derby, England, to Celanese Corp. of America, Delaware.

Process formation sheeted cellulose for nitration. No. 1,971,237. Milton O. Schur, Berlin, N. H., to Brown Co., Berlin, N. H.

Process manufacture paper having hardened surfaces. No. 1,969,592. Leon M. Yoerg, Holyoke, Mass., to American Writing Paper Co., Holyoke, Mass.

Method and apparatus for determining uniformity of sheet formation in paper making machines. No. 1,969,546. Arthur E. Broughton, Wisconsin Rapids, Wis.

Process and apparatus for production paper pulp by sulfite process. No. 1,969,421. Peter A. Paulsen, Appleton, Wis.

Apparatus for pulp wood reclamation. No. 1,969,367. Keith O. Guthrie, Pleasantville, N. Y.

Copper-containing water emulsion as a preservative liquid for treating timber fabric and like materials. No. 1,969,213. John Vargas Eyre and Herbert Langwell, Epsom, England, to The Distillers Co., Ltd., Edinburgh, Scotland.

Process and apparatus for bleaching wood pulps. No. 1,968,994. David B. Davies, Shelton, Wash.

Method of paper manufacture comprising shredding pulp with a solid fusible binder to produce an intimate mixture and suspending in water. No. 1,970,426. Harold L. Levin, Rutherford, N. J., to The Patent and Licensing Corp., New York, N. Y.

Method pulp manufacture. No. 1,970,258. Clinton K. Textor, Cloquet, Minn., to Northwest Paper Co., Cloquet, Minn.

Process of bleaching pulp and other lignified materials in transit. No. 1,970,065. Geo. H. Tomlinson, Montreal, Canada.

Process manufacture sulfite pulp, by cooking cellulosic material with sulfite liquor, removing liquor, and cooking material with water to liberate fibre. No. 1,971,564. Ernst Hochberger, Hawkesbury, Ont., Canada, to Canadian International Paper Co., Montreal, Que., Canada.

Manufacture water-repellent papers of high wet strength; paper being impregnated throughout with regenerated cellulose, and enveloped by wax over practically its entire surface. No. 1,971,274. Geo. A. Richter, and Milton O. Schur, Berlin, N. H., to Brown Co., Berlin, N. H.

Chemical Specialties

Ink Remover

Substantially non-aqueous cream for removing ink stains from the skin. Contains about 500 g. zinc stearate, 300 g. citric acid, 500 cc. 95 per cent. ethyl alcohol, and 2000 cc. diethylene glycol. U. S. P. 1,968,304.

Insecticide from Bergamot Oil

The disinfecting powers of Italian bergamot oil against tubercle bacilli have proved as powerful as phenol, and a new disinfectant based upon bergamot is being made. *The Drug & Cosmetic Industry,* reporting these researches, relates that the insecticide properties were also examined, and a new preparation destroys all insects in a closed room. Use of this essence is valuable in that the atmosphere is perfumed after use, and not accompanied by the usual penetrating odors. Dishes, also, may be sprayed without harm.

Patents—Chemical Specialties

Insecticide composition, capable of forming a stable emulsion with water, comprising a light petroleum oil, preferentially oil soluble sulfonates, and creosote. No. 1,969,491. Elmer W. Adams, Hammond, Ind., to Standard Oil Co., Whiting, Ind.

Preparation cleansing and polishing emulsion, consisting of water, petroleum oil, a finely divided air blown castor oil and a water soluble soap. No. 1,969,387. Jos. A. Tumbler, Balto., Md., to J. A. Tumbler Laboratories, Balto., Md.

Water softening composition containing an alkali and finely divided clay material; ionized. No. 1,969,983. Leo A. Lux, Lakewood, Ohio, to The Lux Electrolyzer Service, Inc., Ohio.

Method and apparatus for making powdered soap. No. 1,971,566. Willis A. Hutton, Tacoma, to W. A. Hutton & Co., Seattle, Wash.

Soap

Soap in Paste Form

This product, described in U. S. P. 1,971,375, includes from 10 to 50% of a soap formed of a hydroxyalkylamine and a fatty acid of a relatively soft fat or oil, from 15 to 60% soap formed of potash and a relatively soft fat or oil, having a moisture content of from 10 to 35%.

Powdered Soap

A continuous process is given in U. S. P. 1,968,526, for producing soap of low moisture content. This is done by advancing under pressure a saponifiable fat and a saponifying alkali, as a continuously advancing stream, through an elongated reaction zone of restricted cross-section wherein the fat and alkali react to effect saponification. Saponification is effected by supplying the heat to said zone and maintaining the advancing stream under super-atmospheric pressure during its passage through the zone, continuously discharging the saponified material from the reaction zone while in a heated condition.

Miscellaneous

New Magnesium Flashlight Powder Composition

Potassium permanganate, potassium nitrate and sulfur are among the ingredients of a new type of magnesium flashlight powder composition which can be ignited without detonation in cartridges through the medium of a percussion cap. In German Patent 592,898, 700 to 900 parts of magnesium are admixed with sulfur (10 to 18), potassium permanganate (100 to 140), potassium nitrate (70 to 85), magnesia (100 to 160) and wood charcoal (10 to 30). *Chemical Age.*

Grinding and Abrasive Wheels

The difficulties encountered in the manufacture of grinding wheels are effectively overcome by the use of Diglycol Stearate, a synthetic wax-like material, easily dispersible in hot water. Product is dispersed in hot water and glycerine, using about 2-5% of Diglycol Stearate based on the weight of abrasives and other solids in the wheel. Dispersion is then mixed with the abrasives and the whole molded to shape. The Diglycol Stearate holds the wheel to the desired shape and on firing completely volatilizes, and disappears.

Fatty Acid Production by Hydrolysis

A process of hydrolyzing fat for the production of fatty acid or glycerol is given in U. S. P. 1,967,319. Fat is dissolved in a water miscible solvent of a group including acetone, methyl ethyl ketone, diethyl ketone, a mixture of acetone and isopropanol, ethylene glycol monoethyl ether, and ethylene glycol monobutyl ether, adding water and an acid catalyst to solution. Solution is then subjected to hydrolyzing temperature; the solvent distilled off; then by decantation separating the water, with the glycerol product of hydrolysis in solution, from the residue.

Krypton and Xenon for Electric Bulbs

In filling electric bulbs with krypton and xenon in place or argon, Georges Claude claims that a 35 per cent. greater light radiation is obtained than before at the same cost, according to *The Chemical Age,* August 25, p. 174. His researches in collaboration with Gonomet and Andre Claude show that these gases can be cheaply produced with ease on the technical scale. The Societe d'Air Liquide plans their manufacture shortly.

Ethylene for Dehulling Process

Tests on proving the effectiveness of ethylene as an agent for removing walnut hulls are being carried on by

G. G. Sorber, of the U. S. Department of Agriculture, and B. D. Moses and J. P. Fairbank, of the University of California. To date the experiments have yielded good results, the use of ethylene being said to materially increase the speed of the dehulling process.

Patents—Miscellaneous

Glass

Method of making laminated glass. No. 1,970,748. Elmer H. Haux, Tarentum, Pa., to Duplate Corp., Delaware.

A compound glass, stable to cold, comprising at least two sheets of glass, and an intermediate layer of hydro-rubber. No. 1,969,397. Manfred Dunkel, Cologne, Wilhelm Breuers, Ludwigshafen-am-Rhine, and Walter Wolff, Mannheim, Germany, to I. G., Frankfort-am-Main, Germany.

Method and apparatus for making glass with salt. No. 1,970,112. Harold A. Wadman, West Hartford, Conn., to Hartford-Empire Co., Hartford, Conn.

Method manufacture ultra violet transmitting glass, adding a halogen compound and small quantity of an alkaline tartrate to glass batch. No. 1,971,309. Kitsuzo Fuwa, Tokyo, Japan, to General Electric Co., Schenectady, N. Y.

Process and apparatus for tempering glass sheets, by creating air blasts against the plate by a zone of sub-atmospheric pressure surrounding the plate. No. 1,971,268. Bernard Long, Paris, France, to The American Securit Co., Delaware.

Water and Sewage Treatment

Apparatus for clarification of sewage liquid. No. 1,969,022. Wm. C. Laughlin, Kew Gardens, N. Y., and Abraham B. Asch, Brooklyn, N. Y., to Filtration Equipment Corp., New York, N. Y.

Method softening water, water treatment, and storage apparatus. No. 1,970,203. Barton S. Snow, Wheaton, Ill., to T. W. Snow Construction Co., Chicago, Ill.

Water treatment and storage apparatus. No. 1,970,202. Barton S. Snow, Wheaton, Ill., to T. W. Snow Construction Co., Chicago, Ill.

Water treatment and storage apparatus. No. 1,970,201. Barton S. Snow, Wheaton, Ill., to T. W. Snow Construction Co., Chicago, Ill.

Petroleum

Colored gasoline containing small proportion 1-methylamino-4 paratolylamino-anthraquinone. No. 1,969,249. Gellert Alleman, Wallingford, Pa., to Sun Oil Co., Phila., Pa.

Process oil refining by neutralizing a sulfonic acid treated oil to recover the organic acids and phenolic bodies. No. 1,969,694. Frank W. Hall, Port Arthur, Tex., to Texas Co., New York, N. Y.

Process removal wax from hydrocarbon oil, using amylene dichloride and methyl ethyl ketone. No. 1,969,670. Bernard Y. McCarty, Beacon, N. Y., and Wm. E. Skelton, Cambridge, Mass., to Texas Co., New York, N. Y.

Process for treating hydrocarbon oils. No. 1,969,502. Walter M. Cross, Kansas City, Mo., to Gasoline Products Co., Inc., Wilmington, Del.

Apparatus for treatment mineral oils by heat. No. 1,969,322. Walter Jas. Perelis, Boston, Mass., to Universal Oil Products Co., Chicago, Ill.

Apparatus for treatment mineral oils by heat. No. 1,969,321. Walter Jas. Perelis, Boston, Mass., to Universal Oil Products Co., Chicago, Ill.

Treatment hydrocarbon oils; said oils being subjected, while in heated vaporous condition, to reaction with an aqueous solution of sulfuric acid in which has been dissolved a sulfate of an alkali metal. No. 1,969,316. Jacque C. Morrell, Chicago, Ill., to Universal Oil Products Co., Chicago, Ill.

Treatment hydrocarbon oils by subjecting said distillates, while in heated vaporous condition, to action of phosphoric acid in presence of a solid salt of a metal, capable of mild oxidizing action. No. 1,969,302. Gustav Egloff and Jacque C. Morrell, Chicago, Ill., to Universal Oil Products Co., Chicago, Ill.

Method and apparatus for natural gasoline recovery. No. 1,969,207. Howard S. Cole, Jr., Pasadena, and Edwin R. Cox, Los Angeles, Cal., to The Texas Co., New York, N. Y.

Process and apparatus for removing wax from hydrocarbon oils. No. 1,969,201. Geo. R. Bryant, Lawrenceville, Ill., and Francis X. Govers, Vincennes, Ind., to Indian Refining Co., Lawrenceville, Ill.

Process for recovery of valuable components from a sludge from treatment of mercaptan-containing hydrocarbon oils. No. 1,968,843. Wm. M. Malisoff, Phila., Pa., to Atlantic Refining Co., Phila., Pa.

Method of treatment of hydrocarbons. No. 1,968,842. Wm. M. Malisoff, Phila., Pa., to Atlantic Refining Co., Phila., Pa.

Production lubricating oils. No. 1,970,402. Harold R. Snow, Hammond, Ind., to Standard Oil Co., Whiting, Ind.

Motor fuel comprising hydrocarbon distillates, product containing small proportion of a gum formation inhibiting agent. No. 1,970,339. Thos. H. Rogers and Vanderveer Voorhees, Hammond, Ind., to Standard Oil Co., Whiting, Ind.

Treatment hydrocarbon oils by treating oil with ammonia in presence of a metal. No. 1,970,281. Roland B. Day, Chicago, Ill., to Universal Oil Products Co., Chicago, Ill.

Treatment hydrocarbon oils to remove color and gum forming components and reduce sulfur content. No. 1,970,283. Roland B. Day, Chicago, Ill., to Universal Oil Products Co., Chicago, Ill.

Process refining hydrocarbon oils. No. 1,970,284. Roland B. Day, Chicago, Ill., to Universal Oil Products Co., Chicago, Ill.

Process refining gasoline with zinc chloride. No. 1,970,143. Franklin E. Kimball, Los Angeles, Cal.

Process treatment hydrocarbon oils. No. 1,969,818. Jacque C. Morrell, Chicago, Ill., to Universal Oil Products Co., Chicago, Ill.

Process treatment hydrocarbon oils and coal. No. 1,969,772. Chas. H. Alberding, Chicago, Ill., to Universal Oil Products Co., Chicago, Ill.

Process conversion heavy hydrocarbon oils into motor fuel and other oils of low molecular weight. No. 19,274. Arthur D. Smith, Chicago, Ill., and John Perl, Los Angeles, Cal., to Donnelly-Jenkins Co., Chicago, Ill. Reissue.

Method thermal treatment hydrocarbon gases. No. 1,971,677. Geo. Howard Coxon, London, England, to Gasoline Products Co., Inc., Wilmington, Delaware.

Method and apparatus for expanding high pressure gas. No. 1,971,518. Ralph D. Booth, Brookline, John R. Coffin, Newton Highlands, and Alex. J. Tigges, Boston, Mass., one-half to Jackson & Moreland, a partnership, and one-half to Standard Oil Development Co., New York, N. Y.

Hydrocarbons high boiling point. No. 1,971,301. Hans Haeuber, Ludwigshafen-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Process treating hydrocarbons involving reaction between objectionable sulfur and mercaptan constituents. No. 1,970,583. Bert A. Stagner, Los Angeles, Cal.

Process for producing low point hydrocarbons. No. 1,970,553. John C. Black, Los Angeles, Cal., to Gasoline Products Co., Inc., Wilmington, Del.

Method for treating hydrocarbons. No. 1,971,252. Walter M. Cross, Kansas City, Mo., to Gasoline Products Co., Inc., Wilmington, Del.

Process and apparatus for production low boiling point hydrocarbons from high boiling point hydrocarbons. No. 1,971,248. John C. Black, Destrehan, La., to Gasoline Products Co., Inc., Wilmington, Del.

Process for converting petroleum hydrocarbons. No. 1,971,244. Henry E. Widdell, Kansas City, Mo., to Gasoline Products Co., Inc., Wilmington, Del.

Process for lubricating oil. No. 1,971,243. John F. Werder, Lakewood, Ohio, one-half to Edmund Rogers, So. Euclid, Ohio.

Treatment hydrocarbon oils. No. 1,971,214. Carbon P. Dubbs, Chicago, Ill., to Universal Oil Products Co., Chicago, Ill.

Process treating hydrocarbon products. No. 1,971,190. Wm. Lelgemann, Newark, N. J., to Hydrocarbon Processes, Inc., New Jersey.

Treatment hydrocarbon oils. No. 1,971,172. Wayne L. Benedict, Chicago, Ill., to Universal Oil Products Co., Chicago, Ill.

Treatment hydrocarbon oils. No. 1,971,167. Mayfield C. Sumpter, Chicago, Ill., to Universal Oil Products Co., Chicago, Ill.

Apparatus for distilling hydrocarbons. No. 1,971,073. Wm. O. Keeling, Kansas City, Mo.

Core oil, mixture of portion of acid oil having had its lighter constituents removed by heat. No. 1,970,916. Elmer H. Payne, Wood River, Ill., to Standard Oil Co. (Indiana), Whiting, Ind.

Lubricant consisting of a salt of alginic acid incorporated in a polyhydric alcohol. No. 1,970,902. Lawrence C. Brunstrum, Chicago, Ill., and Daniel G. Loetscher, Whiting, Ind., to Standard Oil Co., Chicago, Ill.

Method liquid and gas separation. No. 1,970,784. Jay P. Walker, Tulsa, Okla., forty per cent. to Guy O. Marchant, and six per cent. to C. G. Wells, Tulsa, Okla.

Regeneration of doctor sludge. No. 1,970,693. Herbert G. M. Fischer, Westfield, N. J., to Standard Oil Development Co., New York, N. Y.

Process making sulfated derivatives of butene, treating olefine material consisting predominantly of butenes and erythrene. No. 1,970,687. Benj. T. Brooks, Stamford, Conn., to Standard Alcohol Co., Wilmington, Del.

Company Booklets

C253. American Cyanamid Co., 30 Rockefeller Plaza, N. Y. City. American Hortigraphs and Agronomic Review for Sept.-Oct. continues to maintain its high standards as a news dispensing medium.

American Cyanamid offers 6 new booklets from its fertilizer division:

C254. Granular "Ammo-Phos"-high-analysis fertilizer.

C255. Fertilize Corn and Cotton with Granular Aero Cyanamid.

C256. Fertilizing Fruit with Granular Aero Cyanamid,

C256. The Story of Aero Cyanamid.

C258. There is a Place for Aero Cyanamid on Every Crop.

C259. A Handbook for Agricultural Workers. Answers practical questions about cyanamid.

C260. Bakelite Corp., 247 Park ave., N. Y. City. One page leaflet tells the story of Bakelite's connection with the building of the Union Pacific's streamlined train.

C261. Diamond Alkali Co., Pittsburgh, Pa. Four-page mailing piece stresses the question of dependability.

C262. E. I. du Pont de Nemours & Co., Wilmington, Del. "The du Pont Company and Munitions" is an answer to many of the innuendos caused by the recent Senatorial investigation of the munitions industry.

C263. E. I. du Pont de Nemours & Co., Wilmington, Del. A new booklet with the title "Formulating Non-Acid-Forming Fertilizers with Anhydrous Ammonia and Urea-Ammonia-Liquor."

C264. Givaudan-Delawanna, Inc., 80 5th ave., N. Y. City. The Givaudanian for August is like all of its predecessors—so valuable to those who do or could advantageously use odors in their products that they should become regular subscribers. The fee is just a request either to this paper or the company direct.

C265. Magnus, Mabee and Reynard, 32 Cliff st., N. Y. City, has issued Sept.-Oct. price list.

C266. Merck & Co., Rahway, N. J. September price list is available.

C267. Rossville Commercial Alcohol Co., Terre Haute, Ind. Alcohol Talks for September deals with yeast and is called "Little Makers of Alcohol."

C268. Philadelphia Quartz Co., 121 S. 3rd st., Philadelphia, Pa. September issue of P's & Q's deals with the interesting story of cleansing apples with silicate.

C269. The Sharples Solvents Corp., 23rd & Westmoreland sts., Philadelphia, Pa. The booklet "The Sharples Process for Better Leveling Lacquers" is decidedly not "just another booklet." It is the result of 18 months of intensive research in the Thomas & Hochwalt Laboratories in collaboration with the Sharples research organization. The lacquer manufacturer just must have this booklet for review.

Chemical Industries,
25 Spruce Street,
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Company Booklets—Oct.

ADVERTISING PAGES REMOVED

Chemical Production

A digest of plant management, design, equipment and containers for the makers of chemicals

Economics of Batch Sizes

There are numerous instances in the chemical industry in which the theoretical ideal of a continuous process is not a practical proposition, due to the size of the operation, and manufacture is carried on by the batch method. Batch operation may not only be necessary because of size restrictions but also may be due to the nature of the process, such as with reactions under pressure or with certain mixing operations of very viscous materials, as encountered in the paint and similar industries.

The true economic batch size will be dependent upon the market for the product, taking into account not only the present selling price but also market trends with product volume; (*b*) the investment cost, particularly the question of the variation of the cost of the plant in relation to the output; (*c*) overhead charges; and (*d*) operation charges, especially the relationship between the amount of supervision and labor required and the number of units of plant. Batch operation is also subject to the specific consideration of the question of the relation between the efficiency of the operation and the batch size, thus, in the mixing of a solid with a very viscous liquid, it may be possible to overload the plant, requiring an excessive mixing time in proportion to the output. All these considerations, however, relate to the choice and installation of plant, but as batch operation more usually occurs in the smaller industrial firms, where the initial investment cost is of paramount importance, due to capital restrictions, it is of more interest to consider the particular question of the economic batch size in the case of a plant already installed and which has to function in several different manufacturing processes. In this case batch time will be given the specific meaning of the time between two different processes.

In the determination of the economic batch size, use can be made of the methods adopted in the mechanical engineering industries when manufacturing components for stock. The factors involved in the total production time are first, preparing the machine for the work, called the "set-up time;" secondly, the actual time of operation. Many processes in the chemical industries involve a similar set-up time, thus for instance, if an edge-runner has been used for the mixing of black paint, it is necessary to clean the plant thoroughly before using it in the manufacture of lighter shades, also, a machine used for filling tubes with tooth paste will necessitate cleaning before being used, say, for shaving cream. Similar problems are met with in all industries manufacturing a variety of products, although the actual set-up time will vary considerably, from the time required for the thorough cleaning before using a catalyst in a subsequent process to the small degree required when milling household soap dyes using an increasing color-depth in order of manufacture of the various shades.

All too often is control of manufacture based entirely on orders received, with a consequential necessity for continual process change and repeated cleanings, set-up time then acquiring an important aspect in the manufacturing cost. For efficient industrial administration, the question should be tackled from a strict economic viewpoint, and manufacture for stock must be taken into consideration.

It is first necessary to examine the effect of set-up time on the unit cost, and this is best done by considering two fictitious examples. Assuming that the operation and the cleaning are done by the same operator, *i.e.*, the labor cost per machine-hour is constant, then the cost can be equally well represented by time units as by cost units. In the first case let the set-up time be 50 minutes and the time for making one unit of manufacture be 1 minute, and in the second case, with the same set-up time, let the unit operation time be 30 minutes. The following table gives the relation between the size of the batch and the manufacturing time per unit:—

Size of batch (i.e., number of units)	Set-up time	Operating time	Total time	Manufacturing time per unit
Case 1				
10	50	10	60	6.00
20	50	20	70	3.50
50	50	50	100	2.00
100	50	100	150	1.50
200	50	200	250	1.25
500	50	500	550	1.10
1000	50	1000	1050	1.05
Case 2				
10	50	300	350	3.50
50	50	1500	1550	3.10
100	50	3000	3050	3.05
200	50	6000	6050	3.03

It is obvious that decrease in set-up time in relation to unit operation time causes the actual unit manufacturing time to approach its limiting value more quickly. When the limiting value is approached, further increase in batch size will be outweighed by the disadvantages of excessive stock. Too much stock represents idle capital, and in some cases there may also be the risk of stock deterioration or obsolescence.

The problem of economic batch size can, with advantage, be subjected to an approximate mathematical analysis. Let T be the total cost of unit manufacture, which will include (*a*) actual cost of the raw materials; (*b*) proportion of the set-up cost; and (*c*) interest on the capital laid up during storage (including depreciation, obsolescence, etc.). A convenient figure to take for (*c*) is 10% per annum, and this will be used in the following analysis. Also let M be the "movement," *i.e.*, the number of units sold per month, S be the set-up time in cost units, C the cost of raw materials per

- Acids
- Acid Phosphate
- Alumina Hydrate
- Aluminum Chloride
- Alums
- Ammonia Anhydrous
- Ammonium Persulphate
- Bleaching Powder
- Carbon Bisulphide
- Carbon Tetrachloride
- Caustic Soda
- Chlorine
- Ferric Chloride
- Kryolith *(Natural Greenland)*
- Penchlor Acid Proof Cement
- Perchloron *(Made in U. S. A.)* *(Super-test calcium hypochlorite)*
- Salt
- Soda Ash
- Sodium Aluminate
- Sodium Bicarbonate
- Sulphate of Alumina

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unit, and X be the number of units in the batch. Then the cost of raw materials and set-up, *i.e.*, the capital stored, is (CX + S), but, since the movement will be assumed regular, it is obvious that the average stock will be only half that of the batch size, hence the average capital lying idle in store is $\frac{CX + S}{2}$.

The annual interest and depreciation on this capital at 10% will be $\frac{CX + S}{20}$

and as the total units of manufacture per year is 12M, the storage interest per unit will be $\frac{CX + S}{240\ M}$

The set-up cost per unit is obviously S/X, hence the total unit production cost is given by

$$T = C + \frac{S}{X} + \frac{CX + S}{240\ M}$$

$$i.e.,\ T = C + SX^{-1} + \frac{CX}{240\ M} + \frac{S}{240\ M}$$

For T to have a minimum value, $\frac{dT}{dX}$ must equal zero, hence

$$\frac{dT}{dX} = -SX^{-2} + \frac{C}{240\ M} = 0$$

Therefore $X_{min} = \sqrt{\frac{240\ MS}{C}}$

Often the movement is not regular as assumed in the mathematical analysis, special emergency orders always being a feature of the smaller industrial organizations, and the formula will obviously have more value in such engineering processes as the manufacture of components for automobiles, yet an approximate evaluation of the economic batch size will be of assistance in effective administration.—Economic Batch Size Vs. An Important Factor in Manufacturing Costs, by H. Lewis, *Chemical Age*, British, Sept. 8, p. 214.

New Equipment

A monthly digest of new equipment of interest to the chemical and process industries.

Mercury is responsible for a new light source that is expected to exert considerable influence on artificial lighting practice of the future. This new light source is known as the high pressure mercury lamp. Several hundred of these lamps supplied part of the illumination in the exhibit building of Ford Motor at A Century of Progress in Chicago this summer. The high pressure mercury lamp is unique in that it has no filament. Light is produced by a mercury arc stream of great brilliancy. Just how bright is this stream may be realized when we learn that the color temperature of the arc stream is about equivalent to 1½ times the color temperature of the Sun. Characteristics of this new lamp are quite different from the lamps that have heretofore used mercury vapor, because the high temperature and high mercury pressure give the light a color more like that of the blue sky. In addition, these lamps produce almost twice as much light for the same power consumption as in existing types of mercury vapor lamps such as those used for factory lighting. High pressure lamps operate at an efficiency of 35 to 45 lumens per watt as compared to an efficiency of 15 to 20 lumens per watt for present mercury lamps. **QC 172**

Telemetering Control

An electronic relay, by transforming minute electrical currents into useful forces, plays an important part in a new telemetering system recently developed, for measuring pressure, temperature, liquid level, and other factors at distant locations. For distances up to 10 miles, accuracy to within 1% scale reading can be obtained by using a 3 wire connection between the metering device and the remote recording apparatus with telephone lines or their equivalent as the transmitting medium. **QC 173**

Syphon Bottle Filler

A new syphon bottle filler is on the market with 6 or 8 filling spouts, for handling liquids that should be filled "easily" without pressure or violence including liquids of a foamy nature. Bottles of many sizes and shapes are handled efficiently. Every one is filled evenly at any desired height, regulated by raising or lowering the adjustable bottle rest. An automatic float controls and maintains the liquid in the filler tank at a constant level. Monel metal filler tank is completely covered and connects by hose or pipe direct to any storage tank which should, of course, be above the filler so as to get a gravity flow. Filling spouts are bronze tinned. **QC 174**

Industrial Cleaning

A special feature of a new industrial vacuum cleaner is an observation glass which allows operator to see dirt being removed when cleaning. Tremendous power is said to be combined with light weight to make for ease of handling and complete cleaning. Motor unit can be removed for use as a handy blower—aside from standard attachments for cleaning machinery, motors, overhead pipes, walls, floors, rugs and all other industrial applications. Special tools are also available for cleaning furnaces, boilers, ovens, flues, boiler tubes, etc. **QC 175**

Laboratory Emulsifier

A special laboratory emulsifier with a reservoir capacity of one quart, and intended for continuous operation, is being marketed. All parts in contact with the liquids pumped are made of aluminum. Designed to permit rapid dismantling for cleaning. Only one tool is needed. Feature of this pump is the vortex, created by the impeller rotor type pump and the reservoir. The vortex brings the lighter substances down to the pump suction, which makes it possible to secure a rapid and complete emulsification. The high speed impeller rotor type pump has a low discharge pressure and a high film pressure. Two types of rotors are available for various kinds of work. **QC 176**

Metal-to-Glass Seal

A new metal-to-glass seal is available which, because of the certainty with which tight and reliable joints can be made between glass and the alloy called Fernico, openes up many possibilities in the development of various classes of vacuum tubes and other devices wherein leading-in wires or conducting parts must pass through gas-tight insulating seals or themselves form part of a gas-tight chamber. Fernico can be machined, forged, punched, drawn stamped, soldered, copper-brazed, and welded very easily. **QC 177**

Chemical Industries,
25 Spruce Street,
New York City.

I would like to receive more detailed information on the following: (Kindly check those desired.)

QC 172	QC 175
" 173	" 176
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Name .....

Title .....

Address .....

Equip. Oct.

What's News—at Chemical Plants

Softball is now popular. Plants with teams include du Pont Experimental, Union Carbide at Niagara Falls, also Oldbury Chemical of the same place.—Mrs. Anna Clark, Hailesboro, N. Y., is awarded $10,800 for the death of her husband caused by silicosis resulting from inhalation of talc dust.—An explosion in the du Pont dimethyl sulfate unit at Belle occurred Sept. 23 without any personal injuries.—Golfers and tennis players from all parts of the country in employ of du Pont gather in Wilmington for an All-du Pont sports tournament. S. V. Reid of Grasselli Chemical, Cleveland, leads the golfers.

Plant Personals

Elmer P. Rice, du Pont's Deepwater, N. J. plant, is married Sept. 29 to Miss Margaret Robinson of Wilmington.—Robert H. Svenson, 44-year-old chemical engineer of Oldbury Chemical, Niagara Falls, who was reported missing, has been found, victim of an amnesia attack. He had been clear across the continent.—Best proof of the fact that Charleston, W. Va., is a leading chemical city, is to be found in the announcement of Kanawha College that night students can attend day sessions if they are working on "shifts."

Deaths: Charles D. Masterman, 50, Union Carbide paymaster, at Niagara Falls on Sept. 11.

With the Equipment Companies

Harold J. Grieve, a Pfaudler Co. field engineer for 10 years, is now Pittsburgh representative.—Walker & Downing, Pittsburgh advertising agency, now has Patterson Foundry & Machine account. W & D's chemical accounts include Standard Silicate.—York Ice Machinery has exclusive national rights for manufacture and industrial sale of machines that continuously produce frozen water ribbons (FlakIce). This new development was described in CHEMICAL INDUSTRIES, Aug., p 150.—M. A. Eiben, Northern Blower president, reports increasing interest in dust and fume recovery on the part of the chemical industry. He is back in Cleveland with a large order from Southern Alkali for its Corpus Christi plant.—L. Morton Morley, is new Brown Instrument sales manager.—Completion of plans for holding a 4-day welding clinic in New Orleans starting Oct. 24 is announced by Linde Air Products, distributor of materials and equipment for oxy-acetylene welding and cutting.

Chemical Plant Notes

A method of sterilization of goggles, used successfully by Standard Oil of N. J., consists of 1st soaking goggles or other eye protective devices for 5 minutes and then washing them in a 5% solution of cresol, lysol or similar phenol antiseptic. This solution will not injure fabric and is of sufficient antiseptic power to prevent transmission of infection from one individual to another.

Heavy Chemicals

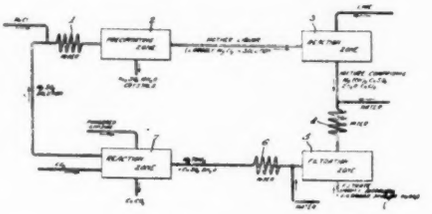
Process of forming ammonium salts (largely the phosphates) by the direct reaction of ammonia gas with a liquid acid capable of forming various ammonia salts depending on the temperature employed, is described in U. S. Patent 1,971,563, assigned to the Great Western Electrochemical Co. A liquid acid is atomized into a chamber containing ammonia gas adapted to chemically combine with the acid to form a salt desired. Control of temperature governs and controls finished product obtained.

Oxalic Acid Process

According to a German process for the manufacture of oxalic, potassium sulfate is converted into formate by the action of an alkaline earth formate or components yielding the same, followed by conversion of the formate into oxalate by heating at temperatures of 300—450° C., and preferably under reduced pressure. This product is then treated with alkaline earth hydroxide to give caustic potash lye and an alkaline earth oxalate, the former of which is separated off and concentrated if desired, while the latter is treated with mineral acids to convert into oxalic acid.

Sodium Sulfate Manufacture

A method for the preparation of sodium sulfate from sodium chloride and calcium sulfate consists in reacting sodium chloride with magnesium sulfate solution to precipitate sodium sulfate, which is removed. The magnesium sulfate solution is reformed by treating the mother liquor with lime to produce a slurry composed largely of magnesium hydroxide and treating said slurry with calcium sulfate in the presence of carbon dioxide to produce a solution which after removal of insoluble compounds is substantially magnesium sulfate. The re-formed solution is returned for reaction with further sodium chloride. Process is covered by U. S. Patent 1,971,754 and is controlled by Texaco Salt Products.



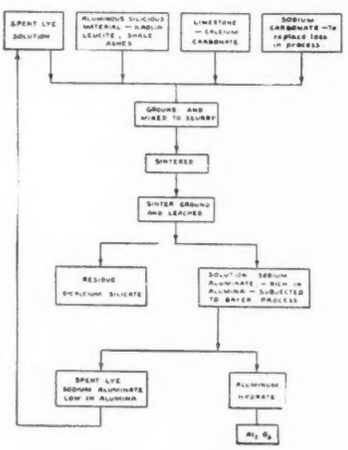
Process Flowsheet

Sulfuric Catalyst

U. S. Patent 1,971,465 describes a catalyst for use in the contact method of making sulfuric, consisting of a vanadium compound and a thallium compound in which the gram-atoms of thallium are between 3 and 6 times the gram-atoms of vanadium.

New Source of Alumina

A recent U. S. Patent has been issued for a method of treating aluminous silicious material, charging such material with calcium carbonate and alkali aluminate of low alumina content in the molecular proportion of one molecule of silica to 2 molecules of calcium oxide and of one molecule of alumina to from one to 1.7 molecules of alkali metal oxide, heating the charge to form a sinter, dissolving the alkali aluminate, separating a portion of the aluminum therefrom, and returning the resulting alkali aluminate of low alumina content for reuse in the process.



Process Flowsheet

Patents—Industrial Chemicals, Equipment

Process manufacture high-grade bleaching powder. No. 1,969,236. Heinrich Reitz, Bitterfeld, Germany, to Pen-Chlor, Inc., Phila., Pa.

Adhesive made from shellac in a volatile liquid vehicle. No. 1,969,636. Gardner R. Alden, Framingham, Mass., to Dennison Mfg. Co., Framingham, Mass.

Method of production solid CO_2. No. 1,969,703. Geo. D. G. Cribb and Wm. H. Whitby, London, England, to International Carbonic Engineering Co., Kennett Sq., Pa.

Adhesive being mixture of aqueous emulsion of asphalt and glue. No. 1,969,659. Wm. W. McLaurin, Brookfield, Mass., Old Colony Trust Co., executor of said McLaurin, deceased.

Method production alkali-metal carbamates from alkali-metal bicarbonates. No. 1,969,516. Robet. Burns MacMullin, Niagara Falls, N. Y., to The Mathieson Alkali Works, Inc., New York, N. Y.

Process of producing plaster of Paris from by-product calcium sul-

tate from acid manufacture, using phosphatic sources containing fluorine. No. 1,969,449. Chas. S. Bryan, Rumford, R. I., to Rumford Chemical Works, Rumford, R. I.

Apparatus and method of treating gases with acids. No. 1,969,381. Edwin J. Mullen, New Rochelle, N. Y., and Walter S. Allen, Flushing, N. Y., to General Chemical Co., New York, N. Y.

Method of starch conversion by adding a non-starchy component gel inhibiting agent and a starch conversion agent to flour. No. 1,969,347. Hans F. Bauer, Chicago, Ill., to Stein, Hall Mfg. Co., Chicago, Ill.

Process for manufacture artificial wood board. No. 1,969,291. Alwin Antoni, Roth, near Gelnhausen, Germany.

Method treating road aggregates by imparting motion to the materials, forming them into a moving tubular mass; then coating. No. 1,969,283. Kenneth H. Talbot, Milwaukee, Wis., to National Equipment Corp., Milwaukee, Wis.

Process and manufacture linoleum. No. 1,969,272. Abraham B. Miller, Lancaster, Pa., to Armstrong Cork Co., Lancaster, Pa.

Process production forfuryl xanthate; an alkali metal salt of furfuryl xanthate acid. No. 1,969,269. Cornelius H. Keller, San Francisco, Cal., to Minerals Separation North American Corp., New York, N. Y.

Priming composition containing lead peroxide; having incorporated in the composition a small proportion of a catalyist or sensitizer for the lead peroxide. No. 1,969,246. Alfred Weale, Heswall, England, to Imperial Chemical Industries, Ltd., Great Britain.

Method dispersion solids. No. 1,929,242. Andrew Szegvari, Akron, Ohio, to American Anode, Inc., Akron, Ohio.

Two processes for manufacture acetic and lactic acids by fermentation. No. 1,969,237. Eloi Ricard and Firmin Boinot, Melle, France, to Usines de Melle.

Production butyl alcohol by fermentation. No. 1,969,218. Clarence W. Hancock, Peoria, Ill., to Commercial Solvents Corp., Terre Haute, Ind.

Method and apparatus for solidfying CO_2. No. 1,969,169. Theophil Eichmann, Bern-Liebefeld, Switzerland, to International Carbonic Engineering Co., Kennett Square, Pa.

Apparatus for heat exchanger. No. 1,969,135. Geo. T. Jacocks, Larchmont, N. Y., and John L. Krieg, Hollis, N. Y., and Stanley J. Chute, Ridgewood, N. J., to Alco Products, Inc., New York, N. Y.

Brine solution for refrigeration use, consisting of barium-potassium and sodium chlorides dissolved in water. No. 1,969,124. Wm. G. Finch, Greenville, Mich., to Kold-Hold Mfg. Co., Lansing, Mich.

Process lined barrel construction. No. 1,969,120. Wm. E. Coakley, Milwaukee, Wis., to Pressed Steel Tank Co., Milwaukee, Wis.

Apparatus for molding plastic products. No. 1,969,083. Wilfred G. Lawson, Akron, Ohio, to B. F. Goodrich Co., New York, N. Y.

Apparatus for use in determination of grain sizes in granular material. No. 1,969,081. Mikael Vogel-Jorgenson, Copenhagen, Denmark, to F. L. Smidth & Co., New York, N. Y.

Means for measuring and indicating temperature from a distance. No. 1,969,072. Ezer Griffiths and Arthur Snow, Teddington, England.

Production cobalt titanate by mixing neutral titanium oxide pulp and cobaltous carbonate; drying mixture; then calcining. No. 1,969,061. Winfred J. Cauwenberg, Brooklyn, N. Y., to Titanium Pigment Co., New York, N. Y.

Pyritic smelting and recovery of sulfur. No. 1,969,021. Nils Erik Lenander, Lokken Verk, Norway, to Texas Gulf Sulphur Co., Houston, Texas.

Fused waterproofing composition; non-tacky; will not stain white paper; comprising petrolatum wax, ester gum and paraffin. No. 1,968,907. David E. Pearsall, Pitsburgh, Pa., to Ensign-Bickford Co., Simsbury, Conn.

Aryl mercapto compounds by reacting a halogenated phenol with molten mixture of an alkali metal sulfide and an alkali metal hydroxide. No. 1,968,906. Keith Wm. Palmer, Fartown, Huddersfield, England, to Imperial Chemical Industries, Ltd., Great Britain.

Process for purification of carbonic acid gas produced by fermentation and other processes. No. 1,968,899. Leopold Nathan, Zurich, Switzerland, to Hansena A.-G., Glarus, Switzerland.

Method and apparatus for applying powdered asphalt to mineral wool to form a binder. No. 1,968,851. Oliver F. Mottweiler, Gimco City, Ind., to General Insulating & Mfg. Co., Alexandria, Ind.

Process of making structural adsorptive carbon. No. 1,968,847. Jacque C. Morrell, Oak Park, Ill.

Process of making structural adsorptive carbon and product. No. 1,968,846. Jacque C. Morrell, Oak Park, Ill.

Process for production of activated carbon by mixing hardwood charcoal with an aqueous emulsion of a binder. No. 1,968,845. Jacque C. Morrell, Oak Park, Ill.

Method separation constituents of gaseous mixtures. No. 19,267. Claude C. Van Nuys, Cranford, N. J., to Air Reduction Co., Inc., New York, N. Y. Reissue.

Process heat transfer. No. 19,265. Thos. Midgely, Jr., Worthington, Albert L. Henne, Columbia, and Robt. R. McNary, Dayton, Ohio, to General Motors Corp., of Delaware. Reissue.

Method separating or extracting bodies from partial oxidation products. No. 1,970,535. Jos. Hidy James, Pittsburgh, Pa., to Clarence P. Byrnes, Sewickley, Pa.

Process preparing â-methylol-â-ethyl-butyraldehyde. No. 1,970,374. Paul Halbig, Felix Kaufler and Hans Deger, Munich, Germany, to Dr. Alexander Wacker, Gesellschaft fur Elektrochemische Industrie G. m. b. H., Munich, Germany.

Apparatus and method of humidifying air. No. 1,970,234. Lyman C. Huff, Winnetka, Ill.

Process dissolving cellulose by mixing with aqueous solution of hydrochloric acid, then adding strong sulfuric acid to dissolve cellulose. No. 1,970,270. Nicholas U. Berchin, Cleveland, Ohio, to Thurlow D. Gregory, East Cleveland, Ohio.

Process for making siliceous product. No. 1,970,280. Arthur B. Cummins, Plainfield, N. J., to Johns-Manville Corp., New York, N. Y.

Method of purifying ammonium thiocyanate. No. 1,970,303. Wilhelm Gluud, Portmund-Eving, Germany, to Gesellschaft fur Kohlentechnik m. b. H. Dortmund-Eving, Germany.

Process of digesting silicious material in an alkaline solution is improved by calcining prior to digestion by removing organic matter therefrom. No. 1,970,255. Geo. E. Taylor, Westfield, N. J., to General Chemical Co., New York, N. Y.

Method treatment diatomaceous earth with chemical agents. No. 1,970,204. McKinley Stockton, Redondo Beach., Cal., to Dicalite Co., Los Angeles, Cal.

Method treating recovered sulfur. No. 1,970,147. Stanley Isaac Levy, Kingston Hill, England.

Method insulating and protecting molten baths from oxidation by use of free aluminum oxide. No. 1,970,136. James S. Gummert, Tarentum, and John E. Hutchinson, Pittsburgh, Pa., to Pennsylvania Salt Mfg. Co., Pittsburgh, Pa.

Floor covering comprising homogeneous mixture of benzyl cellulose, neutral aromatic ether of a polyhydric alcohol, and a vegetable filler. No. 1,970,090. Arthur Clement Hetherington, Ardrossan, and Stuart Anderson Sim, Saltcoats, Scotland, to Imperial Chemical Industries, Ltd., Great Britain.

Process for making sulfuric acid ester of anthranols. No. 1,970,083. David Alexander Whyte Fairweather and John Thomas, Grangemouth, Scotland, to Scottish Dyes, Ltd., Grangemouth, Scotland.

Apparatus for separating and collecting dust particles and liquid globules. No. 1,970,077. Thos. Bosanko Collins, Strathbungo, Glasgow, Scotland.

Electrolytic process for manufacture of chemical compounds. No. 1,970,076. Antonio Llorens Clariana, Valldemosa (Balearic Islands), Spain.

Method making chlorophenylphenol. No. 1,969,963. Edgar C. Britton and Fred. Bryner, Midland, Mich., to Dow Chemical Co., Midland, Mich.

Process manufacture cellulose crotonates. No. 1,969,882. Henry Gault and Bernard Marius Robert Angla, Lyon, France, to Societe des Usines Chimiques Rhone-Poulene, Paris, France.

Method making chlorophenylphenol. No. 1,969,963. Edgar C. Britton and Fred. Bryner, Midland, Mich., to Dow Chem. Co., Midland, Mich.

Reduction organic compounds using alkali metals and lower alcohols. No. 1,971,743. Heinrich Bertsch, Chemnitz, Germany, to American Hyalsol Corp., Wilmington, Del.

Process production primary alcohols, reducing acid esters of organic acids of the carboxylic group with alkali metals and lower alcohols in presence of a pressure of hydrogen of about 15 to 20 atmospheres. No. 1,971,742. Heinrich Bertsch, Chemnitz, Germany, to American Hyalsol Corp., Wilmington, Del.

Process production monobasic aluminum sulfite. No. 1,971,668. Erich Wiedbrauck and Karl Buche, Essen-Ruhr, Germany, to Th. Goldschmidt A.-G., Essen-Ruhr, Germany.

Ether of Polyvinyl alcohol. No. 1,971,662. Albrecht Schmidt, Gerhard Balle, and Kurt Eisfeld, Frankfort-am-Main, Germany, to I. G., Frankfort-am-Main, Germany.

Thermophoric composition consisting of an anhydrous mixture of chlorides of aluminum, sodium, and ferric. No. 1,971,660. Ernst Sander, Berlin-Charlottenburg, Germany.

Process making vinylacetylene. No. 1,971,656. Granville A. Perkins and Walter J. Toussaint, South Charleston, W. Va., to Carbide & Carbon Chemicals Corp., New York, N. Y.

Manufacture zinc oxide. No. 1,971,639. Cornelius Raymond Beringer, Budapest, Hungary, to "Smelting" Kohaszati es Femmuvek Reszv.-Tars. in Pesterzsebet, Pesterzsebet, Hungary.

Process oil gel composition. No. 1,971,636. Julian T. Baldwin, West Chester, Pa.

Process highly oxidized oil gel., subjecting dispersion of oil gel in a volatile dispersing medium to pressure, and introducing oxygen into dispersed gel. No. 1,971,634. Julian T. Baldwin, West Chester, Pa.

Process manufacture ammonium phosphates and other salts. No. 1,971,563. Wilhelm Hirschkind and Harry Bender, Antioch, Cal., to Great Western Electro-Chemical Co., San Francisco, Cal.

Adhesive comprising dried milk and amide as a dispersing agent. No. 1,971,522. Henry V. Dunham, Bainbridge, N. Y.

Method treating waste residues. No. 1,971,479. Isaac Dubinbaum, New York, and Lindsay R. Christie, Pittsburgh, Pa.

Catalyst useful in contact method of making sulfuric acid, comprising a vanadium and a thallium compound. No. 1,971,465. Leopoldo G. Salazar, New York, N. Y., to Calco Chemical Co., Inc., Bound Brook, N. J.

Method and apparatus for mixing oils. No. 1,971,379. Edwin S. Pearce, Indianapolis, Ind., to Railway Service & Supply Corp., Indianapolis, Ind.

Stabilized chlorinated aliphatic hydrocarbon with about 0.13% by weight of a natural resin. No. 1,971,318. Leroy C. Stewart and Lee de Pree, Midland, Mich., to The Dow Chemical Co., Midland, Mich.

Production sound images on films or plates by chromate process. No. 1,971,276. Carl Roehrich, Berlin, Germany, to Silfree Aktiengesellschaft (Silfree, Ltd.), Vaduz, Liechtenstein, Germany.

Method of chlorination. No. 1,971,241. Chas. F. Weitzel and Harry G. Potts, Wyandotte, Mich., and Jude E. Underwood, Swarthmore, Pa., to Pennsylvania Salt Mfg. Co., Phila., Pa.

Process catalytic oxidation CO contained in a gas, by contacting gas with a catalyst of a manganite of a heavy metal. No. 1,971,168. John Morris Weiss, New York, N. Y., to Davis Emergency Equipment Co., Inc., New York, N. Y.

Manufacture and improvement of friction elements. No. 1,971,163. Izador J. Novak, Bridgeport, Conn., to Raybestos-Manhattan, Inc., Bridgeport, Conn.

Asbestos sheet having paper-machine characteristics containing a sizing material adsorbed in the fibers and substantially insoluble in water of pH 8-10. No. 1,971,162. Izador J. Noval, Bridgeport, Conn., to Raybestos-Manhattan, Inc., Bridgeport, Conn.

Classifier. No. 1,971,153. Harold B. Coulter, Denver, Colo., to The Dorr Co., Inc., New York, N. Y.

Method manufacture solid CO_2. No. 1,971,106. Rudolph Leonard Hasche, Tacoma, Wash., to Carbonic Development Corp., Delaware.

Process for photochemical oxidation of organic and inorganic compounds. No. 1,971,042. Ignaz Kreidl, Vienna, Austria.

Process purifying iron from sulfur. No. 1,971,041. Bo Michael Sture Kalling, Djursholm, and Carl von Delwig, Avesta, Sweden, to A. Johnson & Co., Stockholm, Sweden.

Floor covering comprising base formed from a plastic material adhesively attached thereto. No. 1,971,036. James E. Graham, Needham, and Edwin M. Lines, Dedham, Mass., to Bird & Son, Inc., East Walpole, Mass.

Process preparation alkali cyanates. No. 1,971,009. Hermann Theodor Joseph Konig, Dordrecht, Netherlands, to N. V. Stikstofbindingsindustrie "Nederland," Dordrecht, Netherlands.

Manufacture gas with emulsified fuel. No. 1,970,996. Marvin W. Ditto, New York, N. Y., to Gas Fuel Corp., New York, N. Y.

Process weather-resisting building material containing layer of asphalt with surfacing granules partially embedded therein. No. 1,970,953. Orin R. Douthett, Passaic, N. J., to Patent & Licensing Corp., Boston, Mass.

Process and apparatus for sulfur trioxide production. No. 1,970,923. Wm. L. Spalding, Westfield, N. J., to American Cyanamid Co., New York, N. Y.

Tile composition consisting white cement, calcium stearate, indin, quartz or marble dust, earthdye, casein, and casein glue. No. 1,970,921. Andreas Schneider, New York, N. Y., one-third to Anni Miller, Jersey City, N. J.

Improved wax process. No. 1,971,305. Wilhelm Pungs, Ludwigshafen-am-Rhine and Michael Jahrstorfer, Mannheim, Germany, to I. G. Frankfort-am-Main, Germany.

Method waterproofing plaster, by treatment with a material adapted to prevent impervious crystallization of salts. No. 1,970,857. Arthur K. Laukel, Detroit, Mich.

Adhesive for joining abrasive article to a backing member, comprising soft rubber and a synthetic resin. No. 1,970,835. Raymond C. Benner, Niagara Falls, N. Y., to Carborundum Co., Niagara Falls, N. Y.

Apparatus for washing bottles using caustic soda. No. 1,970,788. Robt. J. Wynne and Paul H. Meyer, Bellwood, Ill., to Solar-Sturges Mfg. Co., Melrose Park, Ill.

Process production acetone from acetaldehyde. No. 1,970,782. Lloyd C. Swallen, Terre Haute, Ind., to Commercial Solvents Corp., Terre Haute, Ind.

Process refining emulsified compounds. No. 1,970,771. Robet. H. Russell, Cleveland, Ohio, to Gas Fuel Corp., New York, N. Y.

Process preparation ketonic perylene derivative. No. 1,970,710. Cecil Shaw and Robt. Fraser Thomson, Grangemouth, Scotland, to Imperial Chemical Industries, Ltd., Great Britain.

Selective agent for mineral recovery comprising asphalt, hydrogenated vegetable oil, solvent for asphalt, and a metal selective constituent. No. 1,970,701. Geo. D. Kratz, Scarsdale, N. Y., to Benj. Briscoe, New York, N. Y.

Process and catalyst manufacture hydrogen. No. 1,970,695. Geo. H. Freyermuth, Elizabeth, N. J., to Standard Oil Development Co., New York, N. Y.

Calcium sulfate plaster mix. No. 1,970,663. Victor Lefebure, London, England, to Imperial Chemical Industries, Ltd., Great Britain.

Method making pencil lead. No. 1,970,603. Harold Grossman, Newark, N. J., one-half to American Lead Pencil Co., Hoboken, N. J., and one-half to Eberhard Faber Pencil Co., Brooklyn, N. Y.

Aqueous emulsion. No. 1,970,572. Harry A. Murray, Jr., New York, N. Y., and Gordon D. Patterson, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Method compounding non-corrosive fluid, comprising glycerine, oil, emulsifying agent, and mercaptobenzothiazole. No. 1,970,564. Kenneth Harry Hoover, Deerfield, Ill., to Ass'n Amer. Soap & Glycerine Producers, Inc., New York, N. Y.

Apparatus for centrifugal separation. No. 1,970,552. Julien Berge, Tirlemont, Belgium, to Raffinerie Tirlemontoise, Societe Anonyme, Tirlemont, Belgium.

Process for centrifugal separation. No. 1,970,551. Julien Berge, Tirlemont, Belgium, to Raffinerie Tirlemontoise Societe Anonyme, Tirlemont, Belgium.

Process for electrochemically producing stable images and characters. No. 1,970,539. Viktor Bausch, Jr., Berlin, Germany.

Catalyst for and oxidation of SO_2. No. 19,282. Franz Slama, deceased, late of Ludwigshafen-am-Rhine, Germany, and Hans Wolf, Ludwigshafen-am-Rhine, Germany, to General Chemical Co., New York, N. Y. Reissue.

W. Harvey, Pittsburgh, Pa., to E. R. Squibb & Sons, Brooklyn, N. Y.

Mucin solvent agent, containing an ethanolamine, capable of producing a water soluble mucinate. No. 1,969,340. Clarence C. Vogt, Lancaster, Pa.

Process for manufacture ureas, and substances of like character of the naphthalene series. No. 1,969,299. Geo. Malcolm Dyson, Cheadle Hulme, and Arnold Renshaw, Manchester, England, to Parke, Davis & Co., Detroit, Mich.

Photographic developer comprising an N aryl substituted aminophenol. No. 1,969,243. Harlan L. Trumbull, Hudson, Ohio, to B. F. Goodrich Co., New York, N. Y.

Process improved manufacture highly refractory products by admixing beryllium oxide to a mixture of zirconia, as main constituent, and some magnesia. No. 1,969,099. Eugen Ryschkewitsch, Frankfort-am-Main, Germany, to Deutsche Gold & Silber Scheideanstalt vormals Roessler, Frankfort-am-Main, Germany.

Process for manufacture colored photographic images. No. 1,968,956. Humphrey Desmond Murray and Douglas Arthur Spencer, South Kensington, London, England, to Colour Photographs (British and Foreign), Ltd., London, England.

Method of removing primary aromatic amines from aqueous solutions. No. 1,969,913. Waldo L. Semon, Silver Lake Village, Ohio, to B. F. Goodrich Co., New York, N. Y.

Manufacture of the ammonium salt of the urea of m-amino-benzoyl-m-amino-p-toluyl-l-naphthylamine-4:6:8-trisulphonic acid. No. 1,968,820. Geo. Malcolm Dyson, Cheadle Hulme, and Arnold Renshaw, Manchester, England, to Parke, Davis & Co., Detroit, Mich.

Process making transparent film for protective purposes by dissolving gelatin, glucose, glycerin and formic acid in water. No. 1,970,388. Theo. Fritz Menzel, New York, N. Y.

Hydrocarbon substituted mono-bromophenol with at least one substituting alkyl radical. No. 1,969,801. Emil Klarmann, Jersey City, N. J., to Lehn & Fink, Inc., Bloomfield, N. J.

Preparation ethanolamine salt of a cellulose ester containing a dicarboxylic acid radical. No. 1,969,741. Chas. R. Fordyce, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Bromine substituted allylester of 2-phenylquinoline-4-carboxylic acid. No. 1,971,393. Walter G. Christiansen, Bloomfield, and Raymond Van Winkle, Passaic, N. J., to E. R. Squibb & Sons, Brooklyn, N. Y.

Process photographic reversal development. No. 1,970,869. Eduard Schloemann, Leverkusen, near Cologne-am-Rhine, Germany, to Agfa Ansco Corp., Binghamton, N. Y.

Process for isolating levulose as the lime levulate. No. 1,970,605. Ralph Malcolm Hixon, Jas. Harvey McGlumphy, Jack Waldo Eichinger, Jr., and John Hall Buchanan, Ames, Iowa, to Iowa State College of Agriculture and Mechanic Arts, Ames, Iowa.

Manufacture of fluoro-halo derivatives of hexachloroethane. No. 1,970,562. Albert L. Henne, Columbus, Ohio, to General Motors Corp., Delaware.

Manufacture aromatic sulfonates with oleum. No. 1,970,556. Thos. S. Carswell, Kirkwood, Mo., to Monsanto Chemical Co., St. Louis, Mo.

Fine Chemicals

A process for the continuous manufacture in a single operation of neutral sodium pyrophosphate in the form of crystals, consists in dehydrating disodium orthophosphate dihydrate in one zone of a rotary tube furnace and igniting the dehydrated product in another zone of the furnace.

Patents—Fine Chemicals

Method of saccharifying cellulose-containing substances, such as wood, by means of mineral acids. No. 1,969,600. Eduard Farber and Friedrich Koch, Heidelberg, Germany.

Cellulose organic ester composition containing an ester of maleic acid. No. 1,969,482. Henry B. Smith, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Method of rendering surface of an extended flexible film of a cellulose derivative translucent and light diffusing. No. 1,969,481. Alfred D. Slack, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Process for nitrocellulose cement. No. 1,969,477. Adolph C. Rittman, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Preparation halogenated fatty acid esters of cellulose. No. 1,969,468. Carl J. Malm and Chas. R. Fordyce, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Method of packaging by means of a non-self-shrinking sheet of cellulose organic ester material free from water-soluble compounds. No. 1,969,453. Robt. L. Churchill, Kingsport, Tenn., to Eastman Kodak Co., Rochester, N. Y.

Process and film for making multicolor substractive photographic prints. No. 1,969,452. John G. Capstaff, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Method preparing photographic emulsion containing oxa-x-cyanines. No. 1,969,448. Leslie G. S. Brooker, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Process preparing dibenzothiocarbocyanines. No. 1,969,447. Leslie G. S. Brooker, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Preparation photographic emulsion containing pseudo-cyanine dyes. No. 1,969,446. Leslie G. S. Brooker, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Preparation photographic emulsion containing neothiazolocarbocyanines. No. 1,969,445. Leslie G. S. Brooker, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

An amino derivative of carboxy-alkoxy diphenyls. No. 1,969,357. Walter G. Christiansen, Glen Ridge, N. J., and Adelbert W. Harvey, Pittsburgh, Pa., to E. R. Squibb & Sons, Brooklyn, N. Y.

Production alkoxy-3-carboxy-diphenyl. No. 1,969,356. Walter G. Christiansen, Glen Ridge, N. J., and Adelbert W. Harvey, Pittsburgh, Pa., to E. R. Squibb & Sons, Brooklyn, N. Y.

Production 3-carboxy-4-alkoxy-4'-nitro-diphenyl. No. 1,969,355. Walter G. Christiansen, Glen Ridge, N. J., and Adelbert W. Harvey, Pittsburgh, Pa., to E. R. Squibb & Sons, Brooklyn, N. Y.

Production 3-carboxy-4-alkoxy-diphenyl and salts thereof. No. 1,969,354. Walter G. Christiansen, Glen Ridge, N. J., and Adelbert

Coal Tar Chemicals

By a biological and catalytic process, according to the *Chemiker-Zeitung,* Aug. 15, the Kaiser Wilhelm Institute for Coal Research claims to be able to transform water gas into an illuminating gas with higher heating value. Part of the carbon monoxide is first catalytically converted into carbon dioxide and hydrogen by reaction with water vapor and the resulting gaseous mixture then reacted in the presence of bacteria which lead mainly to the formation of methane.

Phthalic Anhydride From Napthalene

A German process, covered in this country recently by U. S. Patent No. 1,971,888, for the manufacture of phthalic anhydride, consists of catalytically oxidizing naphthalene vapor with an oxygen-containing gas by means of a catalyst containing a vanadium oxide, while maintaining the temperature below red heat.

Patents—Coal Tar Chemicals

Preparation hexachlorophenol by exhaustively chlorinating phenol in liquid phase in a solvent in presence of chlorinating catalyst. No. 1,969,686. Edgar C. Britton, Lawrence F. Martin, Francis Nelson Alquist and Roy Lyman Heindel, Jr., Midland, Mich., to Dow Chemical Co., Midland, Mich.

Method of low temperature carbonization of coal. No. 1,969,472. Stuart Parmelee Miller, Englewood, N. J., to The Barrett Co., New York, N. Y.

Apparatus for treatment of coals, tars, mineral oils and the like. No. 1,969,422. Mathias Pier, Heidelberg, Germany, to Standard-I. G. Co., Linden, N. J.

Process production of anthraquinone-acridone derivatives. No. 1,969,216. Ivan Gubelmann, South Milwaukee, and William Dettwyler, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Process sulfonation of beta-naphthylamine. No. 1,969,189. John M. Tinker, South Milwaukee, and Vernon A. Hansen, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Normal ferrous-salt of naphthalene 2-nitro-4.8-disulfonic acid, being a yellowish crystalline substance. No. 1,968,964. August Sigwart, Leverkusen-am-Rhine, Germany, to General Aniline Works, New York, N. Y.

Retort oven for low temperature carbonization. No. 1,968,896. Jos. Mage, Brussels, Belgium, to "Intertrust" Compagnie Generale de Distillation et Cokefaction a Basse Temperature, Societe Anonyme, Glaris, Switzerland.

Process for producing diazoimino compounds. No. 1,968,878. Miles Augustinus Dahlen, Wilmington, Del., and Frithjof Zwilgmeyer, Gordon Heights, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Process preparation ortho-dihydroxy benzene. No. 1,970,364. Fred. Baxter Downing, Carneys Point, N. J., and Richard Gesse Clarkson, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Method of producing ortho-dihydroxy benzenes by hydrolysis of o-dihalogen compounds of the benzene series. No. 1,970,363. Fred Baxter Downing, Carneys Point, N. J., and Richard Gesse Clarkson, Wilmington, Del.. to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production of valuable hydrocarbons from varieties of coal, tars, mineral oils and the like. No. 1,970,248. Mathias Pier, Heidelberg, and Ernst Hochschwender, Ludwigshafen-am-Rhine, Germany, to Standard-I. G. Co., Linden, N. J.

Process for producing cold-flowing bituminous road covering. No. 1,970,164. Anton Breuer, Cologne, and Erwin Osius, Cologne-Sulz-Germany.

Improvement in method preparing cyclohexyl-aromatic hydrocarbons. No. 1,969,984. Lawrence E. Martin and Gerald H. Coleman, Midland, Mich., to Dow Chemical Co., Midland, Mich.

Process manufacture basic derivatives of anthraquinone by effecting amidation of reduced hydroxy-anthraquinones in presence of a non-volatile inorganic alkali. No. 1,969,748. John Hall, Henry Chas. Olpin, Geo. Reeves and Ernest Wm. Kirk, Spondon, near Derby, England, to Celanese Corp. of America, Delaware.

Process making solutions infusible aminealdehyde condensation products by treatment with a chlorhydrin. No. 1,969,744. Alphonse Gams and Karl Frey, Basel, Switzerland, to Ciba Products Corp., Dover, Del.

Process production ortho-dihydroxy benzenes by hydrolysis of an o-dihalogen compound of the benzene series. No. 1,969,732. Fred Baxter Downing, Carneys Point, N. J., and Richard Gesse Clarkson, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Pyrolysis of hydrocarbons. No. 1,971,748. Francis X. Govers, Vincennes, Ind., to Indian Refining Co., Lawrenceville, Ill.

Mixed oil gas and water gas production. No. 1,971,729. Jos. A. Perry, Swarthmore, Pa., to United Gas Improvement Co., Philadelphia, Pa.

Process reforming oil gas. No. 1,971,728. Jos. A. Perry, Swarthmore, Pa., to United Gas Improvement Co., Phila., Pa.

Method making low gravity gas. No. 1,971,721. Albert F. Kunberger, Swarthmore, Pa., to United Gas Improvement Co., Phila., Pa.

Process gas manufacture by admission of high carbon oil to generator during blow run. No. 1,971,717. Price W. Janeway, Jr., Media, Pa., to United Gas Improvement Co., Phila., Pa.

Process manufacture gas and tar. No. 1,971,710. Owen B. Evans, Phila., Pa., to United Gas Improvement Co., Phila., Pa.

Method and apparatus tar distillation. No. 1,971,690. Stuart Parmelee Miller, Englewood, N. J., to The Barrett Co., New York, N. Y.

Process preparation compound of polyarylmethyl series. No. 1,971,436. Max Weiler, Leverkusen-Wiesdorf, near Cologne-am-Rhine, Germany, to I. G., Frankfort-am-Main, Germany.

Sulfonation product of nitrogen containing conversion products of higher aliphatic hydrocarbons. No. 1,971,415. Karl Keller, Frankfort-am-Maine-Fechenheim, Germany, to General Aniline Works, Inc., New York, N. Y.

Preparation aroylene-bis acetic acid-arylides. No. 1,971,409. Franz Henle and Herbert Kracker, Frankfort-am-Main-Hochst, Germany, to General Aniline Works, Inc., New York, N. Y.

Anthraquinone compound: 1-amino-2-chloro-4-methyl-anthraquinone. No. 1,970,909. Ivan Gubelmann, Wilmington, Del., Henry J. Weiland, So. Milwaukee, Wis., and Hans Billroth Gottlieb, Chicago Heights, Ill., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Substituted o-benzoyl-benzoic acid, wherein X represents one of the radicals NO_2 and NH_2. No. 1,970,908. Ivan Gubelmann, Wilmington, Del., Henry J. Weiland, So. Milwaukee, Wis., and Hans Billroth Gootlieb, Chicago Heights, Ill., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Preparation sulfuric ester of 3.3'-difluoro-di-anthrahydroquinone-azines. No. 1,970,654. Leonard Jos. Hooley, Robt. Fraser Thomson and David Alex. Whyte Fairweather, Grangemouth, Scotland, to Imperial Chemical Industries, Ltd., Great Britain.

Process preparation 1.4.5.8-napthalene-tetra-carboxylic acid and derivative thereof, by causing strong oxidizing agent to act in an acid solution. No. 1,970,651. Heinrich Greune and Wilhelm Eckert, Frankfort-am-Main-Hochst, Germany, to General Aniline Works, Inc., New York, N. Y.

Process making anthraquinone-1-aldehydes. No. 1,970,643. Otto Bayer, Frankfort-am-Main, Germany, to General Aniline Works, Inc., New York, N. Y.

Patents—Dyestuffs

Preparation azo dyestuffs free from acid groups. No. 1,969,463. Karl Holzbach, Ludwigshafen-am-Rhine, and Guido von Rosenberg, Mannheim, Germany, to General Aniline Works, New York, N. Y.

Process for dibenzothiocarbocyanine dye. No. 1,969,444. Leslie G. S. Brooker, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Process production vat dyestuff of anthraquinone-acridone series by heating with a metal halide condensing agent an anthrimide-acridone body. No. 1,969,210. Wm. Dettwyler, Milwaukee, and Ivan Gubelmann, South Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Process for preparation metal-containing, non-dyeing, thio-derivatives. No. 1,969,098. Ernst Runne and Karl Larbig, Frankfort-am-Main-Hochst, Germany, to General Aniline Works, New York, N. Y.

Process for preparing dyestuff of anthraquinone series. No. 1,969,044. Cecil Shaw, Geo. Crowe Semple, and Robt. Fraser Thompson, Grangemouth, Scotland, to Imperial Chemical Industries, Ltd., Great Britain.

Vat and sulfur dyestuff preparation. No. 1,968,926. Hermann Berthold and Erwin Liese, Leverkusen-I. G. Werk, Germany, to General Aniline Works, New York, N. Y.

Dyeing preparation. No. 1,968,923. Arthur Zitscher, Wm. Seidenfaden, and Karl Jellinek, Offenbach-am-Main, Germany, to General Aniline Works, New York, N. Y.

Production sulfur dyes by thionating reaction product with an alkaline polysulfide solution. No. 1,968,895. Herbert A. Lubs, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Dyeing preparation comprising aryl-anti-diazo sulfonate, and its conversion to dyestuffs. No. 1,970,070. Arthur Zitscher and Wilhelm Seidenfaden, Offenbach-am-Main, Germany, to General Aniline Works, Inc., New York, N. Y.

Process colored coal and like materials. No. 1,971,683. Wm. A. Holst, Jr., Bayside, N. Y., to National Aniline & Chemical Co., Inc., New York, N. Y.

Anthraquinone dyestuff. No. 1,970,669. Paul Nawiasky and Alfred Ehrhardt, Ludwigshafen-am-Rhine, Germany, to General Aniline Works, Inc., New York, N. Y.

Azo dyestuff insoluble in water. No. 1,970,662. Leopold Laska and Arthur Zitscher, Offenbach-am-Main, Germany, to General Aniline Works, Inc., New York, N. Y.

Process azo dyestuff; combining an aromatic diazo compound with a 3-hydroxy-diphenylamine-4-carboxylic-acid-arylamide. No. 1,970,661. Leopold Laska and Arthur Zitscher, Offenbach-am-Main, Germany, to General Aniline Works, Inc., New York, N. Y.

Vat and sulfur dyestuffs suitable for printing textiles, comprising finely divided compound of group of amino-anthraquinones, and a reduction agent, products such as contain oxygen in the meso-position. No. 1,970,644. Hermann Berthold, Leverkusen, Germany, to General Aniline Works, Inc., New York, N. Y.

Method production triarylmethane dyestuff. No. 1,970,607. Lucas P. Kyrides, Buffalo, N. Y., to National Aniline & Chem. Co., Inc., New York, N. Y.

The Literature

Articles of interest to the chemical and process industries particularly noted in a monthly review of the U. S. and foreign periodicals.

Ceramics. "Automatic Production of High-Grade Potters' Flint." Description of a new model plant operation. *Ceramic Age*, September, p75.

Chemical Specialties. "The Theatre As A Consumer of Sanitary Products." A review of what a large theatre buys. *Soap*, September, p85.

Chemical Specialties. "Bath Salts and Tablets," by Dr. L. S. Malowan. *The Manufacturing Chemist* (British), August, p253.

Chemical Trade. "German Chemical Industry, 1933-34"—abstracted from "Economic Conditions in Germany, British Dept. of Overseas Trade, His Majesty's Stationery Office, London, 3s.6d.net). *The Chemical Age* (British), Aug. 25, p167.

Clays. "The Role of Aluminum in the Reactions of the Clays," by H. Paver and C. E. Marshall. *Chemistry and Industry* (British), Sept. 7, p750.

Detergents. "Sodium Metaphosphate in Mechanical Dishwashing," by Charles Schwartz and Bernard H. Gilmore. An interesting discussion of this new detergent out of Mellon Institute. *Industrial & Engineering Chemistry*, September, p998.

Feldspar. "Modern Processing of Feldspar," by J. H. Weis. *Industrial & Engineering Chemistry*, September, p915.

Glass. "On Chemical Durability," by James Bailey. A discussion of the chemical reactions that take place in glass. *The Glass Industry*, September, p171.

Glass. "Raw Materials Used In Glass Manufacture." *Glass*, (British), August, p300.

Insecticides. "Standard Specifications for Insecticides,"—also contains analysis methods adopted by the British Ministry of Agriculture. *The Industrial Chemist* (British), August, p303.

International. "The Chemical Industries of France—II." An excellent abstract of France's chemical industry taken from "Economic Conditions in France" (7s.net) His Majesty's Stationery Office, London. *The Chemical Age* (British), September 8, p215.

Merchandising. "Researchers vs. Salesmen"—a glib resume of recent chemical progress, by C. C. Furnas. *The American Mercury*, October, p193.

Merchandising. "Compete with U. S.?" A Chicago business man suggests outselling, out-advertising the Government, take the key men away, as the answer to the Government's competition with private business. *Printer's Ink*, Sept. 13, p17.

Metals. "Researches on Tin Promise Profitable Results." International Tin Research and Development Council publish first general report. *The Chemical Age* (British), Sept. 1, p15.

Naval Stores. "Developments in Processing of Resinous Wood Waste," by R. C. Palmer. An authoritative discussion of the steam and solvent extraction processes. *Chemical & Metallurgical Engineering*, September, p456.

Paint. "Uses of Rubber in Paint," by R. L. Fine. A broad survey of the field with the idea of furnishing ideas for future developments. *Paint, Oil & Chemical Review*, Sept. 6, p9.

Paints. "Four-Year Exposure Test on White Lead Paints," by W. J. Clapson and John Schaeffer. A detailed technical study. *Industrial & Engineering Chemistry*, September, p956.

Petroleum. "Chemically Controlled Acidation of Oil Wells," by Sherman W. Putnam, and William A. Fry. A discussion of the Dow process of increasing flow. *Industrial & Engineering Chemistry*, September, p921.

Plant Operation. "Heat and Power Balance in Chemical Plants," by G. Studley. *Chemical & Metallurgical Engineering*, September, p464.

Plastics. "Design and Application of Phenolic Composition Bearings," by O. K. Graef. *The Paper Industry*, September, p410.

Plastics. "Resins from Sulfur and Its Derivatives." *British Plastics and Molded Products Trader*, August, p99.

Rayon. "The Story of a Yarn," by Brooks Darlington. Historical treatment of the subject, taken from the Du Pont Magazine. *American Silk and Rayon Journal*, August, p39.

Refrigeration. "Refrigeration, Food Habits and Food Production," by Helen H. Peffer. Includes interesting discussions of chemical angles. *Refrigerating Engineering*, September, 126.

Refrigeration. "Experiences Abroad and at Home," by Fred. C. Young. An interesting discussion of Chilean nitrate production from the refrigerating angle. *Refrigerating Engneerng*, September, p119.

Rubber. "Compounding With Rubber Latex." A treatise on compoundng liquid rubber from selection of latex grade through varied steps by an outstanding authority, W. J. R. Hauser. *The Rubber Age*, September, p275.

Safety. "Safety in Chemical Laboratories," by Frederic Walker. An industrial viewpoint on the subject. *Journal of Chemical Education*, September, p506.

Safety. "Hazards at Chemical Works,"—the British Chief Inspector's Report contains some outstanding cases. *Chemical Age* (British), Aug. 18, p141.

South. "Chemical Industry Looking Southward," by William Williams Haynes. A popular review of the recent outstanding chemical plant developments in the South and their economic significance. *Manufacturers Record*, September, p. 20.

Shipping. "Packing, Transport and Storage,"—the necessity for selecting suitable containers for chemical products. *The Chemical Age* (Brtitsh), Aug. 11, p117.

Silk. "The Silk Parade Through the Ages." A historical resume. *American Silk and Rayon Journal*, August, p21.

Soap. "A Break With Tradition in Soap Manufacture." A splendidly illustrated report on the very latest in British soap works. *The Industrial Chemist* (British), August, p293.

Sodium Sulfate. "Sodium Sulfate from Natural Deposits," a patent survey by Kenneth A. Kobe and Carl W. Hauge. *Canadian Chemistry & Metallurgy*, August, p177.

Textiles. "The Finishing of Cotton Piece Goods," by H. S. Aspinall. Includes short resume on each chemical used. *The Dyer & Textile Printer* (British), Aug. 31, p219.

Textiles. "New Uses for Textiles and Textile By-Products." A discussion of possible markets for waste material. *Textile Colorist*, September, p607.

Water Treatment. "Modern Methods of Boiler Water Treatment and Control," by H. T. Fisher. A very comprehensive discussion of the entire subject. *The Paper-Maker and British Paper Trade Journal*, Sept. 1, p166ts.

Water Treatment. "The Trend of Modern Taste and Odor Control," by F. E. Stuart. Discussion of the use of activated carbon. *Water Works and Sewage*, September, p327.

Plant Management

Many organizations with affiliates, subsidiaries, or branches have the problem of how best to account for the transfer of materials and products between plants. Policyholders Service Bureau of the Metropolitan Life Insurance Co. has completed a report of a survey of inter-company accounting policies as represented by the practices of a number of corporations. The report is not so much concerned with details of accounting practice as with the executive policies involved as revealed by the methods of the 34 companies that contributed to the investigation.

As the report points out, there are 2 general types of inter-company commodity sales and transfers: those taking place continuously as normal procedure within an organization; those that are casual and take place because of special circumstances that may arise occasionally. Report considers the pricing of such sales and transfers, discussing use of market price as basis, the use of cost, or cost plus an additional charge. Combination of these methods were found to exist and are described. Time of billing and methods of settlement are also discussed.

A detailed account of the practices of each of six of the 34 companies is presented in a separate section of the report and a brief tabular resume of the basic policies of all the companies is given. Copies of this report, which is entitled, "Accounting Policies in Inter-Company Sales and Transfers" may be had by addressing the Policyholders Service Bureau, Group Insurance Division, Metropolitan Life Insurance Co., One Madison ave., N. Y. City.

Govt. Publications

A digest of federal government publications and other booklets from various sources of interest to the chemical and process industries.

Census of Manufactures, 1931:
Silk and rayon goods, rayon and allied products, 10 p. 5c.*
Wood distillation and charcoal manufacture, 4 p. 5c.*

Flax. Flax fiber production from the raising viewpoint. Agriculture Dept., Farmers' Buletin 1728. 5c.*

Safety Standards for the protection of the head, eyes and respiratory organs, revised, 1934. 54 p. 10c.*

Tariff Reports; Laminated Products, 11 p. U. S. Tariff Commission Report No. 82. 5c.*

Standards Research Papers:
Calorimetric determination of the heats of combustion of ethane, propane, normal butane, and normal pentane. Research Paper 686. 5c.*
Photochemical decomposition of silk. Research Paper 697. 5c.*
Thermal expansion of artificial graphite and carbon. Research Paper 693. 5c.*

Federal Specifications:
Bluing, laundry. Specification O.-B.-491. 5c.*
Detergent, hand, paste and powder for mechanics' use. Specification P.-D.-221. 5c.*
Ferrotitanium. Specification qq-F-191a. 5c.*
Ink, drawing, waterproof, colored. Specification TT-I-531. 5c.*
Powder, scouring, for highly polished glass. Specification P-P-596. 5c.*

Bureau of Mines, Advance Summaries:
Tin in 1933. Mineral Markets Reports No. M.M.S. 314.
Lime Industry in 1933. Mineral Markets Reports No. M.M.S. 311.
Portland Cement Industry in 1933. Mineral Markets Reports No. M.M.S. 315.
Antimony in 1933. Mineral Markets Reports No. M.M.S. 313.
Nickel in 1933. Mineral Markets Reports No. M.M.S. 312.
Secondary Metals in 1933. Mineral Markets Reports No. M.M.S. 308.

Bureau of Mines, An Apparatus and Method for the Determination of Helium in Natural Gas. Information Division.

A Survey of the Terms Used in Designing Qualities of Goods. Consumers' Advisory Board, National Recovery Administration. Contains recommendations on fertilizers.

Miscellaneous

Society of Dyers and Colourists (British) Report of the Fastness Committee in fixing standards for light, perspiration and washing. An outstanding contribution to the literature. Secretary's address, Ocean Chambers, 32/34, Piccadilly, Bradford, England.

*** Note: Where a price is given for Federal Government publications requests should be sent to the Supt. of Documents, Washington. Remittances should be made by postal money order, express order, coupons or check. Postage stamps, foreign money, are not accepted. Currency may be sent at sender's risk.**

Equipment Booklets

E238. Aluminum Co. of America, Pittsburgh, Pa. Use of aluminum is extending into so many fields that the wide-awake executive should receive *The Aluminum News-Letter* regularly.

E239. Battelle Memorial Institute, Columbus, Ohio. A beautifully illustrated brochure explains in detail the facts concerning the Institute—an endowed institution for scientific research in metallurgy and fuels and allied fields.

E240. Harnischfeger Corp., Milwaukee, Wis. This manufacturer of industrial equipment celebrates a golden anniversary. "The Fiftieth Year" is a beautifully bound in gold and purple, and profusely illustrated book of 84 pages that tells the complete history of the company.

E241. Filtration Equipment Corp., 350 Madison ave., N. Y. City. "Filtration and Filters for Industrial Use" is the title of an interesting booklet in two colors, just issued. Among the several types covered are "Rotary Vacuum Filters and Rotary Vacuum Dewaterers, Open Tank Leaf Filters and Magnetite Sand Filters used in the production of chemicals." The Filtration Equipment Corp. is well known for its work in the field of sewage treatment and disposal. That it also specializes in industrial filtration will be news to many. An interesting feature of this new booklet is its make-up, including index tab, to fit the engineer's equipment file. This convenience of reference will be appreciated by the man who has experienced trouble in locating what he wants when he wants it.

E242. Link-Belt Co., 910 S. Michigan ave., Chicago, Ill. Link-Belt News is issued regularly and the plant manager, superintendent, consulting engineer and others will find it desirable to receive it regularly. The September issue contains an article on "Granulated Salt Cake Handled Dustlessly with Vertical Screw Lift." Those dealing with problems of conveying check Link-Belt News regularly. This department will be glad to see that you are placed on the regular mailing list.

E243. Roots-Connersville Blower Corp., Connersville, Ind. Bulletin 100-B12, illustrating and describing the Harrison Inert Gas Producer, has just been issued. They are sole licensees under the Harrison patent issued Jan. 17, '33. These units are built to produce inert gas containing less than 1% oxygen and zero % carbon monoxide when operating on manufactured or natural gas, or fuel oil.

E244. Surface Combustion Corp., Toledo, Ohio. A 4-page leaflet describes the SC continuous bright annealing furnace.

E245. U. S. Electrical Mfg. Co., 1510 S. Western ave., Chicago, Ill. A new development in variable speed motors is announced by the U. S. Electrical engineers. They have incorporated as an inherent part of the U. S. Varidrive motor an application of the Syncrogear. The Varidrive motor, which has met with success in many industries, now is available with gears for increasing or diminishing the speeds, thus enabling the operator to obtain an infinite number of speed selections.

E246. Voland & Sons, Inc., New Rochelle, N. Y. A new leaflet describes No. 800 analytical balance—a balance that can weigh 2 grams, 100 milligrams, without handling weights.

Worthington Pump & Machinery Corp., Harrison, N. J., have issued a series of new booklets:

E247. Worthington Equipment for the Refinery and Natural Gasoline Plant.

E248. Worthington Horizontal Duplex Pumps for the Petroleum Industry.

E249. Worthington Centrifugal Pumps for Refineries, type UT, two-stage.

E250. Worthington Centrifugal Pumps for Refineries, type LT.

E251. Worthington Centrifugal Pumps for Refineries, type UV, four-stage.

E252. Worthington Centrifugal Pipe Line Pumps.

E253. Worthington "HiVol" Piston Pumps.

E254. Worthington Horizontal Duplex Piston Pumps for the Petroleum Industry.

E255. Anchor Cap & Closure Corp., Long Island City. A 4-page booklet stresses beauty for closures through Anchor molded caps.

Chemical Industries,
25 Spruce Street, New York City.

I would like to receive the following booklets; specify by

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Equipment—Oct.

ADVERTISING PAGES REMOVED

Chemical Markets & News

National Labor Board Interpretation of Section 7-a Provokes Wide Discussion—Richberg Attempts To Define Rights of Labor and Employers—Du Ponts Testify Before Senatorial Committee Investigating Munitions

National Association of Manufacturers advises members to ignore recent majority rule decision of the National Labor Relations Board until passed upon by "competent judicial authority." Specific case concerns Houde Engineering Corp., Niagara Falls, N. Y., and ruling is to the effect that when a majority of employes of a company vote for one form of organization to represent them, that organization should be recognized as the collective bargaining medium for all. Law dept. of the N.A.M. reports that the ruling is not supported by alleged precedents cited by the Labor Board; flatly contradicts President Roosevelt's interpretation of NRA's Section 7a when settling the automobile strike; and also is contrary to many interpretations of that famous section by leading NRA officials. In all these instances, rights of minorities to choose method of representation were rigidly upheld. Union officials, particularly A.F.L. leaders, hail Labor Board's decision, of course, as a major victory. Bitter denouncement of N.A.M.'s decision to fight Board's ruling comes from A.F.L. President Green, calling such opposition "very near conspiracy to violate the law."

DETERMINED TO FIGHT

Business executives, however, are determined to fight. Decision is termed by such leaders as direct repudiation of basic American principles and liken it to a ruling that a 51% victory at the poles for either Democrats or Republicans should give to the victorious party 100% representation in Congress. Rights of minorities are just as sacred and inviolable as are those of majorities, they maintain.

Nor is labor likely to be 100% in favor of such an interpretation as that given in the Houde case. Already textile strike indicated sharp divisions of opinions among labor organizations over this very question. Consensus of opinions expressed in trade press and newspapers is that the decision is a most unfortunate one, and only adds further ambiguity to Section 7a.

New NRA head, Donald R. Richberg, attempting to clarify Section 7-a in a speech on Oct. 4 before the National Press Club, simply added to the confusion, is the opinion of a large part of the press and a number of leading executives.

SIZE IS A FACTOR

While terming individual bargaining a "mockery" in the field of large industrial corporations, he held that the right to such bargaining may be the "essence of tranquil relationship" between employe and employer in small firms and businesses. He believes that the law must be broad enough to cover all cases. He accused both employers and labor of attempting to twist every interpretation of 7-a towards selfish ends. Referring specifically to the now celebrated Houde Engineering case, Mr. Richberg denied that the National Labor Board's decision conflicted with the interpretation laid down jointly by him and General Johnson a year ago last August. He complained that a number of industrialists were complaining about the decision without having first read it; that without sound reason they were assuming that the decision required a majority vote in a plant or in a company and that that majority was to determine the representation of the workers.

"As a matter of fact," Mr. Richberg is quoted as saying, "it was carefully laid down in the Houde case that they were not passing upon what the unit of voting should be at all, whether it was the plant or craft unit or what not. It happened in that case that the men in the plant voted as a unit and there was no controversy. But the Board carefully pointed out that they were not laying down the theory that majority of all the employes of the plant must be decisive.

"They laid down the theory that when an election by any group, no matter what its size, was held for the purpose of selecting their representatives and when they had chosen, by a majority of their representatives, those were the men who had been chosen to represent the voters."

Strangely enough first protest against Mr. Richberg's stand came not from industrial leaders, but from the most prominent labor spokesman, William Green. Within a few hours of Mr. Richberg's speech in Washington a "hot" reply was made by the president of the A. F. of L. in San Francisco. Said he:

"We insist that an agreement made between an employer and a majority of his employes for wages, hours, and working conditions apply to all employes in the company or plant."

Mr. Green branded any plan whereby an employer might bargain with individuals and minorities and make agreements with them as "utterly impracticable" and "would mean chaos in industrial relations."

BATTLE LINES DRAWN

Thus the lines of battle are being more closely drawn and the issue involved made clearer. Labor, more specifically the American Federation of Labor, insists that whatever form of representation the majority of workers decided upon must be binding upon all the employes and must be recognized as the collective bargaining agency for all by the employer. Employers, on the other hand, insist that employe minorities have rights of bargaining and are entitled to make separate agreements. When, where and how this issue will be finally interpreted remains unknown. But, at least, a clear cut issue is at hand.

DuPonts-Munitions

Senatorial Committee investigating munitions and munitions makers, quizzing the du Ponts, brothers Pierre, Irenee, Lammot, and cousin Felix, aside from revealing Irenee as an inveterate pipe smoker, unearthed a wealth of material for screaming newspaper headlines, but actually disclosed but very few facts not already known by all chemically well-informed.

Reporters, sensing "sensational stuff" when Pierre du Pont revealed close working arrangements with British I.C.I. and that company's predecessors running back as far as 1908, were chagrined to learn later that such understandings were com-

VERSATILITY

THE VERSATILITY OF THE HOOKER ELECTROCHEMICAL COMPANY'S ORGANIZATION, COUPLED WITH FULLY ADEQUATE FACILITIES AND RESOURCES, IS MAINTAINED ALWAYS READY TO MEET EMERGENCY PEAKS.

SUCH FORETHOUGHT AND ACTION ASSURE CUSTOMERS OF QUALITY-STANDARDS THAT DO NOT VARY, TECHNICAL FIELD SERVICE OF THE HIGHEST CALIBRE, ADEQUATELY MAINTAINED STOCKS, AND TRANSPORTATION FACILITIES THAT INSURE PROMISED DELIVERIES. THE RESULT IS AN EVER READY, STABLE, RELIABLE SOURCE OF HIGH GRADE CHEMICALS.

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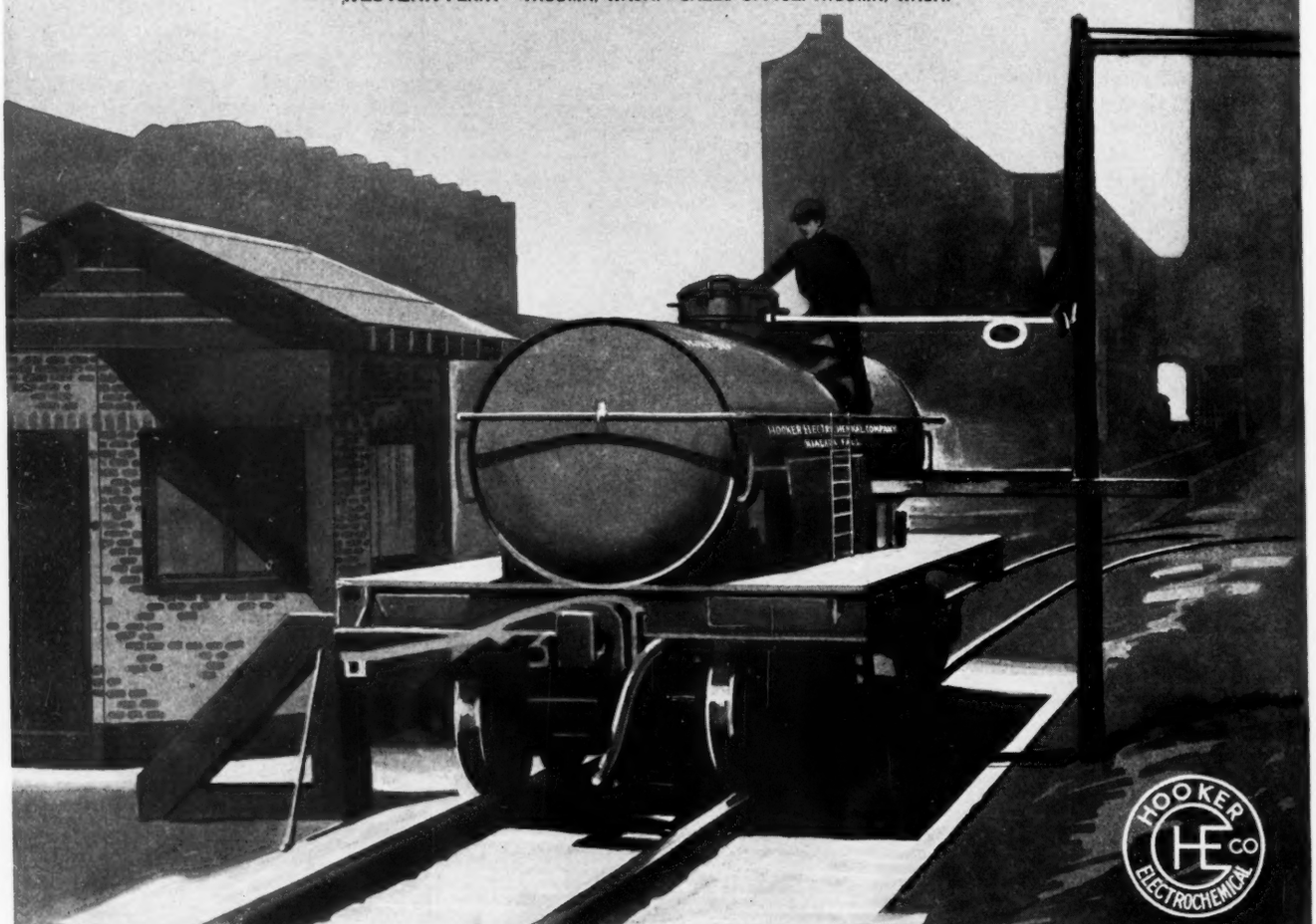

HOOKER HE CO ELECTROCHEMICAL

CAUSTIC SODA, LIQUID CHLORINE, BLEACHING POWDER, MURIATIC ACID, MONOCHLORBENZENE, ORTHO-DICHLORBENZENE, PARA-DICHLORBENZENE, TRICHLORBENZENE, TETRACHLORBENZENE, HEXACHLORBENZENE, SODIUM BENZOATE, AMMONIUM BENZOATE, BENZOIC ACID, BENZOIC ANHYDRIDE, BENZOYL CHLORIDE, PARA-NITROBENZOYL CHLORIDE, BENZYL CHLORIDE, BENZYL ALCOHOL, BENZOTRICHLORIDE, CHLORTOLUENE, ALUMINUM CHLORIDE ANHYDROUS, ANTIMONY TRICHLORIDE ANHYDROUS, ARSENIC TRICHLORIDE ANHYDROUS, TIN TETRACHLORIDE ANHYDROUS, FERRIC CHLORIDE SOLUTION, FERROUS CHLORIDE SOLUTION, SULFUR MONOCHLORIDE, SULFUR DICHLORIDE, SULFURYL CHLORIDE, THIONYL CHLORIDE, ACETYL CHLORIDE, PROPIONYL CHLORIDE, ALPHA-CHLORNAPHTHALENE, SPECIAL SALT, HYDROGEN.

HOOKER CHEMICALS

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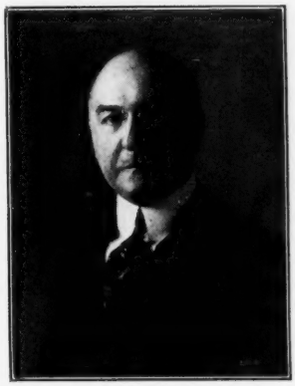
monly known of within the industrial chemical field. That the du Ponts and I.C.I. owned and controlled Canadian Industries, Ltd., has been pointed out in this and other industry papers many times, while as recently as last February, CHEMICAL INDUSTRIES reported formation of a joint stock company in the Argentine by these two huge chemical producers (See p. 148 February issue).

NOT SO WELL KNOWN

Not so well-known was the ownership of interests of $200,000 or more by the du Pont Company in the German I. G. and the Bakelite Corp., nor the personal ownership by all except Pierre of stock in both Atlas and Hercules. It was brought out that the du Pont Company had no control over these organizations which were separated from the du Pont Corporation in 1913 when the so-called "explosives trust" was broken up and Atlas and Hercules were formed.

"OLD STUFF"

Pierre du Pont, in a lengthy verbal statement, emphasized that the facts disclosed were generally "old stuff." Said he, "I want to say that everything brought out here thus far has been a matter of record for many years." He was referring specifically to information that du Pont filled $1,245,000,000 in World War orders, and made huge profits thereby.



PIERRE DU PONT

Titular head of the House of du Pont tells inquiring Senators—"Everything has been a matter of record."

"We don't want the rising generation to think that this information has been kept secret and finally dragged out as something reprehensible."

ISSUES "WHITE BOOK"

Feeling that the situation required a detailed statement, the du Pont Company has issued a booklet in which it is shown that explosives constitute but 2% of du Pont profits in last 10 years; peace-time products outweigh military explosive business in the proportion of 50 to one. "We do not want war," emphatically states Lammot du Pont, "we have vastly more to gain from peace."

* October shows improvement.

Obituaries

Henry O. Herford, 55, Calco export manager, from a revolver wound discharged accidentally while at practice on Sept., 9. He was in turn foreign sales executive and sales manager for National Aniline. In '29 he went to Anglo-Chilean Nitrate, and 3 years later, joined Calco.— William J. Ward, 46, Merck assistant general sales manager, member of the company for over 30 years, on Sept. 23.—Charles Robert Rosevear, 75, member of the gum firm, Thurston & Braidich, on Sept. 22.—John J. Flannery, 57, for 32 years captain of Grasselli's coast steamer *Eugene Grasselli,* on Sept. 21.—Samuel Jones, American Potash & Chemical engineer at Trona plant, in an automobile accident, on Sept. 21.—Arnold Freschman, 76, president, Madison Glue, on Sept. 17 after a lingering illness.

Associations

¶ A.C.S. Will Meet in N. Y. in '35—Permanent Business Conference Groups—Dow Speaks in N. Y. on Bromine and Gold—Insect Losses.

Popular conception of the American chemical industry dates from the beginning of the World War, but the 300th anniversary of the establishment of chemical industries in America will be celebrated at world's largest scientific meeting to be held in N. Y. City by the A. C. S. during the week beginning April 22, '35, it is announced.

From 7,000 to 10,000 representatives of chemical science, chemical industry, and allied fields will participate, according to the announcement by Prof. Arthur W. Hixson, of Columbia, who is general chairman of a New York Committee to arrange for the conclave. Committee hopes to have President Roosevelt deliver the opening address.

A plan to organize permanent conference groups of executives in business and industry, is announced by the Personnel Research Federation. Developed to meet the new problems which are being created, by rapid economic, governmental, social, and technological changes, the plan aims to establish and to maintain bases for harmony in employe relations. Further details are available from the Engineering Foundation, 29 W. 39th St., N. Y. City.

DOW BROMINE

President Willard H. Dow of Dow Chemical and Leroy C. Stewart tell N. Y. Section of the A.C.S. about the commercial recovery of bromine from sea water, at the first meeting of the fall season, Oct. 5.

BUGS

Du Pont entomologist, Dr. I. L. Ressler, startles combined Rochester, Syracuse and Cornell A.C.S. sections with statement that 6,000 known species of insects and plant diseases cause a loss in excess of $3,500,000,000 annually. Weeds are responsible for a $3,000,000,000 annual loss.

COLLECTIONS

N. Y. Credit Men's Association lists no change in collection conditions in chemicals in the last month, but conditions are not as satisfactory as they were at this time a year ago.*

BRIEFLY SUMMARIZED

Refrigerating Machinery Association with W. S. Shipley in the chair meet at Chicago's Stevens Oct. 22.—Research Chemist Harris, Colgate-Palmolive-Peet, tells the N. Y. Section of the American Association of Textile Colorists & Chemists all about "Soap—From Manufacturer to Consumer" at Sept. 28 meeting at Elm Golf Club, Paterson, N. J. — Electrochemists at annual meeting hear how black diamonds are made from boric acid.—Newark branch, American Electroplaters' Society, finds delight in a clambake at Springfield, N. J. on Sept. 29.—Preparations are assuming final form for annual meeting of the International Acetylene Association, to be held at the William Penn Hotel, Pittsburgh, Nov. 14, 16.

William F. Zimmerli is A.C.S. delegate at 14th Congress of Industrial Chemistry at Paris, Oct. 21-27, held by Societe de Chimie Industrielle.—Maywood Chemical's Dr. Hans Osborg shows samples of lithium alloys at the Electrochemical Society meeting held at the Pennsylvania, N. Y. City, Sept. 27-29.

News Oddities

Gen. R. J. Travis, U. S. A., suggests rosin as an explosive base. New uses for rosin are welcome news in the South.—Young chemist, John L. Bauer, walked into Cambridge, Mass. hospital and calmly announced that he could not be saved—he had taken a poison for which no antidote is known. Meal he ate absorbed most of the poison and he is recovering.—Osmium, world's heaviest substance, weighs 251,100 times more than hydrogen, the lightest.—Tannic acid is now recommended for treatment of burns.

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Foreign

GREAT BRITAIN

"Scarab" is a new molding powder of the urea-formaldehyde type being marketed by Beetle Products, Ltd., for which some new and startling claims are being made in British trade press.—I. C. I. declares a 2½% interim dividend.

CANADA

Canadian Industries is constructing 1st Canadian hydrogen peroxide plant at Shawinigan Falls as an extension to Cellophane plant. Estimated cost —$250,000. Same company owns a 6-months option on Neepawa Salt.—Company reduces all explosives 25c per hundred lbs., 3rd similar reduction in past 10 months. Increased volume makes possible operating economies, is answer assigned—Soviet *S.S. Kim* brings 5,000 tons of potash to Montreal. —Consolidated Mining & Smelting is increasing zinc dust production capacity.

GERMANY

Sugar from wood—Bergius process—will receive all benefits and concessions accorded beet sugar. Deutsche Bergin A.G., Ludwigsshaven, is exploiting process. Additional plant is to be located at Regensburg. German beet sugar output shows sharp losses in recent years.—Germany prohibits new plants for white lead, red lead, litharge, zinc oxide, lithopone and other pigments.—New organization of entire German chemical industry along lines and basis of leadership principle is described in *Chemische Industries* of Sept. 8. Herr Pfotenhauer is leader. There are 17 subsections, each with its own leader. —German Bemburg and I. G.'s Dormagen Copper Rayon Works will exchange inventions, experience, etc.—No new lamp black plants or additions to old ones may be made. These and many other control regulations are contained in a recent decree of the Minister of Economics.

FRANCE

Syndicate International du Carbure and French carbide producers offer prizes for new uses, other than synthetic, for calcium carbide and acetylene.—Ceremonies of official opening of La Maison de la Chimie will take place in Paris Oct. 19 and 20. International aspects will bring together representatives from many countries and principal chemical organizations of the world.

JAPAN

Japan Nitrogenous Fertilizer is offering a lacquer from a cellulose acetate base. Other attempts in this direction in Japan have failed.—Japan Soda is now making 20 tons of tartaric monthly.

CHINA

Die Chemische Industrie Aug. 25, quoting from a Chinese source, refers to a nitrogen-fixation plant which is in project at Soochow Creek, Shanghai. It appears that such a plant is soon to be erected by Tien Lee Synthetic Nitrogen Products, which is closely connected financially with Yien Yuen Electro-Chemical. Much of the equipment is said to have been acquired from National Ammonia, while the section of the plant for the conversion of ammonia into nitric is being bought in France. It is thought that this is the plant mentioned in the recent testimony of the du Ponts before the Senate Committee investigating munitions and munitions makers.

COMING EVENTS

American Oil Chemists' Society, Medinah Club, Chicago, Oct. 11-12.
American Photo Engravers Association, annual meeting, N. Y. City, Oct. 11-13.
Packaging Machinery Institute, Edgewater Beach Hotel, Chicago, Oct. 12.
National Pharmacy Week, Oct. 8-13.
Southwest Water Works Association, Hotel Hilton, Waco, Tex., Oct. 15-18.
Dairy Industries Exposition, Cleveland, Ohio, Oct. 15-20.
Eleventh Southern Textile Exposition, Textile Hall, Greenville, S. C., Oct. 15-20.†
National Electrical Mfrs. Association, annual meeting, Palmer House, Chicago, Ill., Oct. 17-20.
California Section, American Water Works Association, Long Beach, Calif., Oct. 24-27.
Penn. Water Works Association, Haddon Hall, Atlantic City, Oct. 29-31.
Refrigerating Machinery Association, annual meeting, Hotel Stevens, Chicago, Oct. 22.
Federation of Paint & Varnish Production Clubs, annual convention and joint show, Mayflower Hotel, Washington, D. C., Oct. 28-30. E. F. Maloney, du Pont, Chicago, chairman of the "Paint Show"; V. C. Bidlack, McCloskey Varnish, Philadelphia, chairman of the program committee.
Philadelphia Section, American Association Textile Colorists & Chemists, Penn Athletic Club, Oct. 26.
American Gas Association Convention and Exhibition, Atlantic City, week of Oct. 29.
Official Agricultural Chemists, annual meeting, Washington, Oct. 19-31.
National Paint, Varnish & Lacquer Association, annual convention, Washington, Hotel Mayflower, Oct. 31-Nov. 3. R. W. Elton, secretary, 2201 N. Y. Ave., N. W., Washington.
National Foreign Trade Council, annual meeting, Hotel Commodore, N. Y. City, Oct. 31-Nov. 2.
American Institute of Chemical Engineers, fall meeting, Pittsburgh, Nov. 15-17.
American Bottlers of Carbonated Beverages, 106th Armory, Buffalo, N. Y., Nov. 12-16.
American Petroleum Institute, Dallas, Tex., Nov. 12-15.
National Fertilizer Association, Southern Convention, Atlanta-Biltmore Hotel, Atlanta, Nov. 12-14.
American Society of Mechanical Engineers, annual meeting, N. Y. C., Dec. 3.
Eleventh National Exposition of Power & Mechanical Engineering, Grand Central Palace, N. Y. City, Charles Roth, Manager, Dec. 3-8.
American Association of Textile Colorists & Chemists, annual meeting, N. Y. City, Dec. 7-8.
American Association for The Advancement of Science, Schenley Hotel, Pittsburgh, Dec. 27-Jan. 2.
Third National Knitwear Industrial Exposition, Grand Central Palace, N. Y. City, A. B. Coffman, Manager, Feb. 11, '35.
American Ceramic Society, Hotel Statler, Buffalo, Feb. 17-22, '35.
A. C. S., 89th meeting, N. Y. City, Apr. 22-27, '35.
Exposition of Chemical Industries, Grand Central Palace, N. Y. City, Dec. 2-7, '35.

LOCAL TO NEW YORK*

Nov. 23, Societe de Chimie Industrielle in charge of joint meeting 4 technical societies.
Dec. 7, American Chemical Society.

Secretaries of Chemical Associations and Groups allied to chemistry (also the process industries) are urged to make use of this column.

* Chemist Club unless otherwise stated.
† Postponed until next April.

Foreign Trade

¶ *Germany, Desperate, Turns to Licensing—Far East Dye Trade —U. S. Trade Improves*

Germany's entire foreign trade, both exports and imports, are under complete government supervision, following decree of Economic Minister Hjalmar Schacht Sept. 11. This is the Reich's prescription for its unfavorable trade balance. German Government now dictates what, where and how Germans shall buy abroad. As reported in previous issue, German chemists are being actively prodded by Hitler to provide synthetic substitutes for many natural commodities imported. Twenty-five boards will actually direct and control importations. Fate of American trade with Germany is uncertain.

German chemical exports to the U. S. in '33 totalled 53,073 thousands of marks; imports from the U. S. reached 34,730 thousands of marks, leaving Germany with a favorable balance. Most items imported from this country were raw materials, carbon black, sulfur, naval stores, phosphate rock, borax, etc., commodities for which Germany is hopelessly dependent upon outside sources. Chemical ingenuity will hardly eliminate need of such items, although growth in production of naval stores and phosphate rock in other countries may cause some changes in volume of these items imported by Germany in the future.

U. S. is Germany's second best chemical customer, the Netherlands being first. Future trend, however, is uncertain, for, the severe competition in potash from domestic, Spanish and Russian producers, is likely to cause a decline in future U. S. importations from Germany. A large portion of German chemical exports to us is and has been raw and processed potash salts. Germany, it would appear, is more in urgent need of U. S. raw chemical commodities than this country of theirs, leaving the U. S. with a trump card in negotiations in the chemical group. Nevertheless, outlook is filled with unknown possibilities as Germany struggles to mold

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her foreign trade into new fields to correct an unfavorable trade balance which is fast draining her none-too-large gold reserves. To determine to what extent world-wide boycott resenting Nazi policies and to what degree natural economic forces are to be blamed for unfavorable German trade balance is most difficult, but the former is surely an important contributing factor. The experiment in economic dictatorship and central planning is not proving very successful. Germany has in turn tried tariffs, exchange controls, quotas and now, with these only failures, the present step of licensing is looked to as the panacea for her ills.

Far East Dye Shifts

Germany's Far East dye trade is steadily declining due to several factors, including exchange difficulties, depression in Far Eastern textile-producing countries, and increased sales by Japan and the U. S.

In '31 Germany's dye export to Asiatic countries totalled 25,880 metric tons, (68,000,000 marks). By '33 value had declined almost 50% in value to 34,670,000 marks and quantity of 60% to 10,500 metric tons.

Shipments to China, Germany's best Far East market, declined 67% to 5,450 metric tons and British India's purchases declined almost 50% to 2,950 metric tons. Shipments to Japan were down 57% to 630 metric tons and Netherland India's purchase of German dyes declined 31% to 755 metric tons.

U. S. also is making considerable headway in Far Eastern dye markets. Shipments of coal tar colors, dyes, stains, and color lakes to that area totalled 13,700,000 lbs., valued at $2,679,000, during '33, an incerase of 13%, both in quantity and value, compared with the preceding year. Far Eastern shipments accounted for more than two-thirds of total United States dye exports to all countries during '33. China was the best market for American dyes during that period, taking 11,600,000 lbs. valued at $1,888,600, a substantial increase both in quantity and value over '32.

CHINESE PURCHASES

September Chinese dye business was generally lower than in former years with synthetic indigo consumption being reduced due to the utilization of cheaper dyes, particularly sulfur black, according to cable advices from American Trade Commissioner A. Bland Calder, Shanghai. While no considerable quantities of Japanese indigo has yet been imported, such shipments as have been received have somewhat unstabilized the entire dye market, the cable stated. China's dye imports have continued heavy since the beginning of '34 with exchange favoring the purchase of American dyes. Imports during this period, exclusive of sulfur black, and not including receipts at Hongkong, totalled $4,383,500, or an increase of more than 75% in value. Of this total the U. S. accounted for $893,100, or 91% more by value than during the 1st half of '33. Receipts from the U. S. consist chiefly of artificial indigo, synthesized from coal tar, which showed an increase of 100% in quantity and 145% in value to a total of $738,000. Imports of sulfur black, which in September resulted in decreased consumption of other and more expensive dyes, increased 10%, in volume and 40% in value to $693,000 during the 1st half of '34 compared with the corresponding period last year. Japan was the largest supplier and increased its share in '34 at the expense of Germany and the U. S.

U. S. Foreign Trade

U. S. foreign trade in chemicals and allied products is showing marked improvement during '34, according to a Commerce Dept. survey. Exports in the 1st 8 months of the current year were valued at $75,000,000, an increase of approximately 25% over corresponding period of last year. Devaluation of the dollar has aided materially in stimulating exports, Department announces.

Chemical imports are featured by fertilizer shipments which advanced 27% in the 1st 8 months this year to a total of $19,000,000. Industrial chemical imports rose 11% to $12,350,000.

TERRITORIAL

During year ended June 30, '34, shipments of chemicals and allied products from continental U. S. to the non-contiguous territories of Hawaii, Puerto Rico, and Alaska increased in value over the preceding fiscal year. Hawaii's purchases, amounting to $4,765,000 and covering whole range of chemicals and allied products, consisted chiefly of fertilizers, $1,926,000; paints, pigments, and varnishes, $609,000; chemical specialties, $499,000; and industrial chemicals, $281,000. Puerto Rico took a total of $3,753,000 worth, most important of which were fertilizers, $1,355,000; industrial chemicals, $408,000; and paints and varnishes, $395,000. Alaska, not being a tropical or agricultural country, fertilizer shipments there were unimportant. Chief demand was for mining explosives, which increased nearly a quarter in value, to $365,000. Other contributors to the total of $947,000, were paint products, $147,000; industrial chemicals, $168,000.

SOUTH AFRICAN POSSIBILITIES

Union of South Africa continues an important and growing market for American chemicals and allied products due to improved purchasing power of the South African pound in terms of dollars and to better domestic conditions, according to C. C. Concannon, Chief, Commerce Dept.. Chemical Division.

Imports of such products from the U. S. increased 46% to a total value of $1,444,000 in '33 compared with preceding year and made up more than 6% of the Union's total purchases of American goods and 10% of its chemical purchases from all sources. This increase was due in part to exchange and in part to larger quantity purchases, it is stated. Paint products, consisting chiefly of cold water and ready mixed paints, led list of purchases from the U. S. with an increase of 70% to a total value of $317,670.

Spanish Improvement

Spanish chemical trade is better Imports for 1st half year total $11,400,000, with U. S. supplying $600,000 worth. Approximately 20%, or $1,200,000 of Spain's chemical exports were U. S. consigned, and included potash fertilizers, pyrites, and tartrates. Potash exports for 6 months total 161,500 metric tons ($6,200,000) with U. S. taking 2/5ths of the total, or 64,500 tons. U. S. was also largest buyer of tartrates. Total pyrites exports, 897,300 metric tons show a 15% gain in quantity and 5% gain in value over corresponding period in '33. U. S. took 187,500 tons. Copper pyrites exports total 126,600 tons, as compared with 123,250 tons in the 1st 6-months of '33.

Customs and Tariffs

¶ *Italy Bans Exports of Mercury and Dyes—Russian Mineral Oil Suspected "Dumped"*

Italy now prohibits exports of mercury in any form. European countries are said to be quietly accumulating large reserves of mercury which is essential to the manufacture of high explosives. Great Britain is said to have acquired over 1,000,000 lbs. in the last 9 months.

Seriousness of this latest ban may be judged from the fact that Italy

next to Spain is the largest world supplier of mercury. It is expected that this action of Italy will strengthen the price structure of the metal in this country.

Customs' Rulings

Bureau of Customs announces that notice of suspected dumping covering importations of Russian white petroleum oil from Belgium had been issued by the U. S. Appraiser of Merchandise at the port of N. Y.

GLASS CARBOYS

Collectors have been instructed by the Customs Bureau to resume the liquidation of entries covering imports of lactic acid in glass carboys and to assess duty on the containers in each case according to size as provided in Paragraph 217 of the tariff. Such consignments have been under suspended action since April pending consideration of a claim that no duty applied on the carboys as usual containers.

BRONZE POWDERS

E. D. Howland, Cleveland.—Merchandise assessed for duty at 14c per lb. as bronze powder not of aluminum was shown to consist of 97% powdered tin and 3% powdered zinc. Claim for 12c as powdered tin is sustained.

Briefly Summarized

Italy bans specified coal tar intermediates and dyes, except under import license.—Federated Malay States abolishes export duty on coconuts and copra.—Another imported product is removed from Treasury's list of those under withheld appraisement by announcement of Acting Secretary Robert that a finding of dumping is not justified as to black cobalt oxide from Germany. Action has been suspended on such shipments since June pending the outcome of an investigation.

Litigation

¶ *Union Solvents' Stockholders Sue—Government Appeals Glidden Suit*

Receivership suit is filed in Wilmington, Del. Chancery Court against Union Solvents Corp. by a group of preferred and common stockholders, all residents of Chicago. Complainants are Martin C. Schwab, Otto C. Doering, Max Adler, Horace C. Levinson and Ruth L. Levinson.

Complainants allege that due to the fact that U. S. District Court 2 years ago enjoined the corporation from infringing on the Weismann patent for production of acetone and alcohol by bacteriological processes, corporation has ceased to function and is inactive. It is alleged officers and directors have permitted at least 2 of the latter to borrow funds from the corporation in violation of law and that they have disposed of virtually all of the corporation's assets including Carthage, Ohio, plants, to obtain funds for operation of other enterprises in which some or all of them are interested.

APPEALS IN GLIDDEN CASE

Federal government is filing an appeal in U. S. Circuit Court of Appeals, Cincinnati, from judgment of Federal Judge Jones, Cleveland, dismissing government's suit against Glidden and Forest City Paint & Varnish subsidiary, for recovery of $2,179,329. Sum is sought by the government as taxes alleged to be due on ethyl alcohol, said to have been diverted by the 2 companies for beverage purposes in violation of the Volstead law. See C. I. August, p. 151 for a detailed review of the case.

"Quotes"

¶ *Queeny on British Conditions —Brand on NRA—Huggett on Research*

Edgar M. Queeny, Monsanto Chemical president, writing in Monsanto's house organ, "Current Events," about his recent trip abroad: "One is almost reminded of N. Y. in the late twenties, by the general confidence with which one is met by British financiers and industrialists."

Charles J. Brand, National Fertilizer Association secretary, to Convention of American Trade Association Executives: "My answer to 'What after NIRA?' is, NIRA may be improved, subdivided and rechristened, if necessary, but by saving all of the good that can possibly be saved, its advantages will far outweigh the bad points."

Mr. C. W. Huggett, vice-president and treasurer of Canadian Industries, Ltd., before the Canadian Chamber of Commerce at Winnipeg, answering the question, "What is Research Doing for Business?" "Research is enabling business to produce better and newer commodities more quickly and at less cost. Research is making mankind more independent of the whims and vagaries of nature and by so doing is raising the standard of living of a larger number of people in Canada and in the world."

Traffic

¶ *Railroads Seek Higher Rates —Chemical Industry Led Opposition in '31—Stauffer Complains*

More income or we perish, is the cry of the railroads, opening up a battle for a 15% increase in rates before the ICC. Class I railroads of the nation will fail to meet their fixed charges during the current year by $73,256,000 because of pay roll increases, rising prices of materials and deductions for pension reserves under the Railroad Retirement Act, the Commerce Commission is told by Dr. Julius H. Parmelee, director of the Bureau of Railway Economics.

CHEMICAL OPPOSITION IN '31

Railroads' present plea is the second to be made during the Depression. In '31 railroads asked for a horizontal increase of 15%. Chemical industry, ably represented by such well-known traffic experts as Mathieson's Mabey, Cyanamid's Whittemore and D. A. Dashiel of Norfolk, led the opposition and succeeded in preventing wholesale freight increases, the final ruling being much less than the carriers requested. See CHEMICAL MARKETS, Sept., '31, p. 289.

Traffic Notes

Stauffer Chemical complains to ICC of overcharge on carbon bisulfide shipments from Norfolk, Va. plant over Norfolk & Southern and other carriers, alleging proper rate is 37c against present 50c charge. Refunds and establishment of new rate is asked.—Freight rate changes in schedule for vegetable oils, cake and meal became effective Oct. 3 according to N. Y. Public Service Commission. These changes are in conformity with ICC ruling, docket 1,700, part 8, following vegetable oil investigation.—Unexpected opposition to plea of the railroads for higher rates (See CHEMICAL INDUSTRIES, September p. 247) comes from Railroad Co-Ordinator Eastman, who tells a Petroleum Institute Meeting that what roads need is more volume not higher rates—Manganese and feldspar are 2 other products whose rates are now lower in N. Y.

ADVERTISING PAGES REMOVED

Personnel

¶ *Jefferson Lake Oil Changes—Cruz Represents Chilean Nitrate in Europe—Other Changes*

John Vaccaro, executive vice president, Standard Fruit & Steamship Co., is elected president of Jefferson Lake Oil, producers of sulfur. Mr. Vaccaro, who was vice president, succeeds Arthur Barba, Sr., who relinquishes position because his health forbade his assuming increasingly heavy burdens occasioned by enlarged activities of the company. Mr. Barba is chairman of the board. Frank Coleman, nationally known consulting engineer, is named a director and general manager.

SEEK MORE TONNAGE

Mariano Riveros Cruz is named European representative of the Nitrate Sales Corp. to fill vacancy caused by the death of Enrique Villegas. Mr. Riveros has been nitrate superintendent since '32 and prior to that time assistant nitrate superintendent since '31.

NATIONAL CARBON PROMOTES

Clarence E. Margeson, Superintendent of National Carbon's Niagara Falls plant will take charge of the Company's Clarksburg, W. Va., plant. He is succeeded at Niagara Falls by Hugh T. Reid.

IN NEW FIELDS

Philadelphia Quartz's F. Homer Bell now makes Atlanta his headquarters. He will cover southern textile centers on P. Q. silicates and metasilicates. Bell's chemical knowledge will be missed in St. Louis, but will prove invaluable to southern mill "supers."—Edward Rosendahl, Glyco Products' technical advisor, is now a V-P and general manager.—Eastman Kodak Research Director Mees is now Vice-President C. E. Kenneth Mees, director of research and development.—Vanadium names Oscar Cooper, Lewis G. Bissell, Charles Rees and P. J. Gibbons directors to fill vacancies. President Corey, Jr., reports 1st 8 months' gross at $2,443,058 against $1,541,813 in same period in '33.—H. Krehbiel is now American Catalin (cast phenol-formaldehyde resins) sales manager.—Herbert J. Wollner, N. Y. City consultant, and graduate of Brooklyn Poly, is consulting chemist to the Secretary of the Treasury, a newly created position. He is engaged at the moment with the methanol denaturing question now before the Department.—Jacob Hay, prominent in American Electroplaters' Society circles, is now with Frederick Gumm Chemical, in charge of Chicago and Detroit territory.—L. M. Aycock, formerly with Swann, is with American Potash & Chemical's technical sales staff.

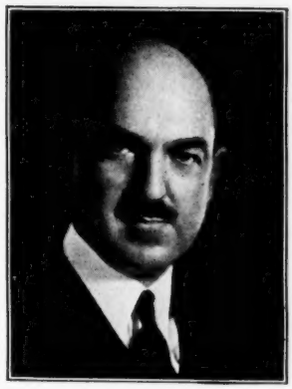
TEXTILE SPECIALTIES

Kane Manufacturing, Chicago, manufacturers and importers of tapioca, flour, starches, gums, etc., adds Joseph H. Young to its textile sales dept. He was formerly with E. F. Houghton & Co.—Victor H. Borman, Onyx Oil & Chemical head, is a member of the Code Authority of the Sulfonated Oil Manufacturing Industry.

Companies

¶ *Bell of Koppers Forms Company—Further Cyanamid Consolidations—DuPont Encourages Home Planting*

Samuel H. Bell, associated with Koppers Products for many years, a member of the board of directors, National Association of Insecticide & Disinfectant Manufacturers, and well known nationally, forms S. H. Bell Company, with headquarters at 1407 Gulf Oil Bldg., to handle coal tar chemicals, by-product sulfur, ammonium sulfate and special oils for the paint and insecticide industries.



SAMUEL H. BELL
Outstanding in the coal tar field, he starts a distributing company.

CALGON DISTRIBUTORS

Calgon, Inc., manufacturers of "Calgon," a sodium metaphosphate detergent developed at Mellon and described in an earlier issue of C. I., appoints following jobbers: American Oil & Supply, Newark; Alden Speare's Sons Co., New York, Boston, Detroit, Chicago and Kansas City; Carman & Co., New York, Buffalo and Chicago; Carman Distributing Co., Omaha; Carman-Roberts Co., Pittsburgh; Dallas Tailor & Laundry Supply Co., Dallas; The Fry Bros. Co., Cincinnati; L. R. Mace Co., Rock Island; McCleary Bros., Inc., Memphis; Morris & Eckels Co., Baltimore; Rudolph Ramelli, Inc., New Orleans; G. S. Robins & Co., St. Louis; E. J. Rutherford & Co., Philadelphia; John T. Stanley & Co., New York; Chas. Tennant & Co., Limited, Canada; Wilbert-Miller Co., Cleveland and Woodley Supply Co., Boston.

NOW "CHEMICAL CONSTRUCTION"

Cyanamid continues to consolidate companies, latest announcement reporting merger of Chemical Engineering with Chemical Construction. New company will be known as Chemical Construction Corp. Staffs of both companies are now available for solution of problems in the heavy chemical industries, specially those in connection with synthetic ammonia and methanol plants (licensed under Nitrogen Engineering Corp. patents); mineral acid plants, including sulfuric, nitric, phosphoric and hydrochloric; and all types of commercial fertilizer plants. Offices will be located at 30 Rockefeller Plaza, N. Y. City.

NEW OIL TANKER

Oelwerke Julius Schindler, Hamburg, is ordering twin-screw motor tanksteamer to augment present fleet of 5 tankers. Company is one of the world's largest producers of lubricating, transformer and Russian white oils, and is represented here by S. Schwabacher & Co., N. Y. City. Recently, German company distributed a beautifully illustrated brochure commemorating its 25th anniversary. Photography could only be described by the word exquisite.

READY TO PRODUCE

Nelio-Resin Corp., recently constructed at Collins, Ga., will be put into operation early in October. Plant will produce nelio-resin, a new product, by a chemical process. E. J. Procter will be manager of the plant, which will employ approximately 25 persons. It is understood that plant cost $75,000.

HOMES BEAUTIFIED

Cash prizes amounting to more than $700 will be awarded to tenants of du Pont Company houses in Carney's Point and Deepwater. Prizes given by the dyestuffs department are for individual efforts and appearance made by them in improving and beautifying the properties in which they live.

OVERHEARD

Retirement of 2 of 7 Fisher brothers from General Motors' directorate is viewed as strengthening du Pont's G. M. hold.—Du Pont's current Atlantic City Boardwalk Display features attractive collection Pyralin and Lucite toilet-

ware.—Same company, through its fabrics division, acquires Velvetex patent. Material is new type of rug lining and rug holder.—Godfrey L. Cabot strikes 2nd natural gas "find" on Sidney White tract in Boone County, W. Va.—Union Carbide's welding exhibit at the National Metal Exposition, Oct. 1-5, Port Authority Bldg., N. Y. City, attracts many viistors. Grasselli's booth is a mecca for a large number also. — National Oil Products' A. E. Briod, told A. C. S. members in Cleveland recently of new method of fortifying milk with vitamin D without any special kind of equipment.—Pure Carbonic moves its Jacksonville warehouse to 107 E. Bay st.—Givaudan-Delawanna's new product "Philaria" intensifies odors.—Magnus Chemical, Garwood, N. J., in a new booklet, describes new method of metal cleaning with "Magnusol."—Barrett's Cleveland plant is damaged to the extent of $75,000 in a spectacular blaze.—Binney & Smith now offers IVO Black No. 100, a still blacker member of the bone black family.

Moves

Sales and purchasing departments of Glyco Products are located in the Flatiron Bldg., N. Y. City. Laboratory and plant will remain in Bush Terminal, Brooklyn, N. Y.

Atlanta Givaudan-Delawanna representative L. C. Morris is now in Citizens & Southern National Bank Bldg., 288 Marietta st.

Personal

A large number of prominent chemical executives saw the recent international yacht races. On hand early for the first race was Frederick W. White's *Adroit II.* Mr. White is now board chairman of Mutual Chemical. Another well-known figure of the bichromate field, President Gorman of Natural Products Refining, was there with a large party aboard one of the liners.

"OVER THE BOUNDING MAIN"

Setting out with high hopes in an auxiliary schooner from Rye, N. Y., Cyanamid's "Larry" Swenson and guests, N. R. Landon, chief engineer of D. L. & W. Coal's "Blue Coal" division, James Price, United Color & Pigment purchasing agent, and Major Hulings, assistant "super" at Cyanamid's Warner's plant, experienced gales, were becalmed, quelled a mutiny and almost heaved a broken-down engine to the bottom of the Sound, but did not sight Block Island nor the international yacht contestants in four days of exciting adventures. Guests finally disembarked at Dr. Landis' estate on the Sound, near Greenwich.

The "Passing Throng"

B. J. ("Gogo") Gogarty, Rossville, succumbs to lure of Rockville Center. Monsanto's "Vic" Williams and Ira Mac Nair, *Soap,* led house-warming committee.—"Larry" Swenson, Cyanamid, is living in South Orange.—C. V. Douglas, ("Doug") of George Chemical, is playing Crescent Athletic's courses at Huntington, L. I. every weekend.—Dr. Thomas H. Norton, Cyanamid, formerly Cincinnati U. chemistry head, in charge at one time of Government's wartime efforts at creating a dyestuff industry, editor of the now defunct *Chemicals,* is luncheon guest of several former pupils Sept. 6 at the University Club, N. Y. City.—Miss Betty Stine, daughter of Charles M. A. Stine, director of du Pont research, will be "debutante" this season. She is now at Duke—W. L. Hewes succeeds Homer C. Simmons, Jr., as president of Hercules Men's Club (Hercules Powder). Club holds monthly luncheons and social programs. —Mr. and Mrs. Brooks Darlington are hosts to a number of Wilmington du Pont couples Sept. 8. Mr. Darlington is associate editor of the du Pont Magazine.—Harry L. Cook, Liquid Carbonic's eastern sales manager, is president of the Sales Executives Club of N. Y.—Leland Doan, Dow, is among a number of Dow Chemical men in the Midland Country Club championship finals.—Lammot du Pont discusses effect of the arms probe in South American countries with Secretary of State Hull and Assistant Secretary, Sumner Welles.—E. M. Allen and Elon H. Hooker are members of the National Advisory Council of the Crusaders.—Harold T. Edgar, president, Edgar Brothers Co Metuchen, N. J., ceramic clays, is a vice-president of Lake Placid Club.—Miss Mary Jane Kenny, daughter of Mr. and Mrs. William F. Kenny, was wed Sept. 27 to Gregory S. Mangin, son of Mr. and Mrs. Joseph J. Mangin. Kenny Senior is a close friend and backer of "Al" Smith; Joseph Mangin is president of United Color & Pigment; and Gregory Mangin is one of the ranking tennis players of the country.

Mr. and Mrs. John Russell Porter announce approaching marriage of their daughter, Pattie Winston, to John Pharr Holmes Oct. 18, at Atlanta, Georgia. Mr. Porter is associated with American Potash and Chemical.

On the Gangplank

By far and large the most popular young lady on the *Leviathan's* last trip was Miss Mary Fyffe, aged eight, daughter of Harold Fyffe, Turner & Co. Miss Fyffe was visiting grandparents in England.—Dr. Henry A. Gardner, paint, varnish and laquer authority, and director, Scientific Section, National Paint, Varnish and Lacquer Association, is back from Brazil after studying various raw materials which might enter into the paint and varnish field. He uncovered some mighty interesting stuff.—Dr. R. W. Mitchell, Magnus Chemical technical director, is in Europe and will spend 3 weeks with Marcel Boss, European agent — Beck, Koller's Dr. William Krumbhaar (V.P. in charge of technical developments) brings back with im from Europe Dr. H. Hoenel, director of research for the European branch of the company, also Otto Reichhold, brother of President Reichhold. Several conferences of company officials are planned. "Hal" Pryor is in Europe.

Construction

¶ *A New Sulfur Development and a Chlorinated Rubber Plant Feature September News*

Duval Texas Sulphur is erecting a plant at Boling Dome, Wharton County, Tex., with a daily capacity of 500 tons of sulfur. Exploration work indicates a workable area of at least 1,000 acres. Plant, according to reliable news sources, hwill be in operation well in advance of July 1, '35, the date required by the leases and agreements under which the property was acquired. It is also understood that the company is continuing to prospect on the Palangana Dome, but unless new deposits are found, it will soon be impossible to economically produce further sulfur from this area.

"TORNESIT" TO BE MADE HERE

Hercules Powder officials announce that work will begin shortly on a new plant at Parlin, N. J., for the manufacture of "Tornesit," company's new protective coating material. With the opening of this plant "Tornesit" will be produced in this country for the first time, replacing the material now being imported from Germany.

TORNESIT DEFINED

Tornesit is a chlorinated rubber product that is rapidly finding use in the protective coating industry because of its great resistance to acids, alkalies, fumes, and other destructive elements. "Tornesit" is also being used for adhesives and plastics and as an impregnating material for textiles and paper. With the construction of a plant in this country it is believed that this new product will find an even wider use in the industrial field.

COVERING THE COUNTRY

Cyanamid will rebuild portion of Latrobe, Pa. plant damaged by a $50,000 fire.—Construction of University of Arkansas' chemistry building is progressing rapidly.—G. E. is enlarging "Glyptal" resin manufacturing facilities and laboratory space at Schenectady.—Union Carbide's $10,000,000 construction job at Whiting, Ind., is again going ahead after labor troubles.—American Agricultural Chemical plans a $200,000 commercial fertilizer plant at South Amboy, N. J.—National Aniline is remodeling old newspaper building at Washington and Dey sts., N. Y. City, for a warehouse and laboratories.—Acheson Graphite will build a $23,000 storage structure in Buffalo.—General American Tank Storage & Terminal is to add additional storage for oils at Carteret, N. J.—Publicker Commercial Alcohol is taking over a 6-acre plot in Philadelphia from the Pennsylvania Railroad for erection of a large addition.—Krebs Pigment & Color will build plant at Edgemoor near Wilmington.—A. E. Staley Mfg. Co., Decatur, soybean oil, etc., plans new $75,000 refinery unit.

Washington

¶ Johnson Leaves NRA—U. S. Chamber Quizzes Administration—N. A. M. Seeks Industry's Opinion of NRA

With President Roosevelt back in Washington the Capitol is again occupying the center of the national stage. Outstanding, of course, in the past month is the resignation of General Johnson from NRA and announcement of the long awaited reorganization plans; successful ending of the etxtile strike by the President's special committee; and the President's novel proposal of a 6 months truce between labor and employers. President's first "Fall fireside talk" is generally conceded to have been favorably received. Where criticism is noted, charge is that his talk again lacked specific assurances and was too general in tone. His entire lack of reference to financial matters in his speech is specially commented upon.

U. S. Chamber Queries

U. S. Chamber of Commerce asks the President to dispel uncertainty regarding major Administration policies and propounds 6 questions:

1—When and how is it proposed to balance the federal budget?

2—Is it the intention of the Administration further to reduce the value of the dollar; if so, then to what figure and what shall be the content of the dollar so reduced?

3—Will the Administration at the earliest opportune moment collaborate with the other nations in an effort to agree upon a plan for the international stabilization of exchange?

4—Will efforts of the Administration be directed toward recovery by the encouragement of business initiative with a minimum of governmental interference and control, and will it discontinue its activities in competition with private enterprise?

5—What is the Administration's policy toward agriculture?

6—Is it the policy of the Administration to continue the construction and development of public works not now needed?

CONFIDENCE LACKING

Lack of confidence is ascribed to the following principal causes:

1—Enormous expenditures by the federal government, with rapidly increasing taxes, and uncertainty as to when and how the budget will be balanced.

2—Increasing activity in the exercise of control over or management of private business by government bureaus and officials.

3—Increasing activity by the federal government in establishing or subsidizing enterprises in competition with private business.

4—Increasing strikes and violent labor disturbances, fostered and encouraged by the radicals in labor organizations.

5—Utterances by those who assume to speak for the Administration which destroy confidence in the security of property and investments and fill the minds of our citizens with grave apprehension for the stability of our government and its financial integrity.

N.A.M. Polls Industry

National Association of Manufacturers is attempting a broad-scale attempt to determine just what thousands of industrialists, "big and small," think about NRA. A set of questions, drafted by a committee of 40 leading executives, is being mailed out. It specifically asks:

1. Do you believe in the general theory of industrial self-government under such governmental restraints as would be necessary to protect the public interest?

2. If so, do you believe that any system of self-government is workable in practice?

3. Do you believe the code system, such as inaugurated under the NIRA, is the proper method?

4. If you believe in industrial self-government through a code system, what would be the respective functions: (a) of industry; (b) of the government; (3) of labor, and (d) of the consumer?

5. If you do not believe in industrial self-government through the code system, do you believe it can be accomplished in any other form and if so what form?

6. Do you have any provisions in your code for price control or open pricing? If so, have such provisions been effective in stabilizing the price structure in your industry?

In addition to these general question, 12 more specific queries are contained in the list. These deal mainly with the desirability of continuing the Recovery Act, the various provisions contained in codes and the best method of administering and enforcing codes.

The 12th question, containing 8 subqueries, is devoted entirely to the problem of labor. The industrialists were asked as to whether they believed that "relations between employers and employes should be regulated by Federal law, either in the present Recovery Act or any similar legislation."

Codes

Furniture and floor wax and polish industry code authority applies for modifications of its code dealing with definitions of terms and with fair trade practices. Sub-section provides for a wall paper cleaner subordinate code and an incerase of 3 members of the code authority to be selected by that division. A new article provides that nothing in the code relating to prices or terms of selling, shipping or marketing, shall apply to export trade or sales or shipments for export. Manufacturers of fabric cleaners are placed under the shoe polish division of the code for the shoe and leather finish, polish and cement manufacturing industry at the request of a group representing approximately 75% of the fabric cleaner manufacturers.

POLISHES

Code authority for shoe and leather finishing, polish, and cement industry, is petitioning for termination of exemption granted by administrative order X-36, which frees members of an industry from the requirement of contributing to the support of a code other than the one which covers their major line of business.

METHANOL

A proposed amendment to the hardwood distillation code to provide for filing of prices is submitted to NRA by M. H. Haertel, secretary of the industry's code authority. Amendment is to apply only to methanol sold for anti-

freeze purposes, and follows closely a similar provision in the industrial alcohol code.

TOLD TELEGRAPHICALLY

Code for adhesives and ink industry is now effective.—Dr. H. R. Moody, College of the City of N. Y., is administration member of the fiber container industry.—Capt. H. B. Lebkicher holds a similar position on code authority for manganese producers.—N. R. A. announces official recognition of code authority for the refined fish oil industry. Members are:—Werner G. Smith, president of the Werner G. Smith Co., Cook Swan Co., and Wyandotte Oil & Fat Co., Cleveland; Ernest V. Moncrieff, president, Swan-Finch Oil Corp., New York; Fred E. Loud, Philadelphia, president, Murray Oil Products Co., Philadelphia; Murray Oil Products Co., New York, and Industrial Oil Products Corp., Los Angeles; Louis J. Reizenstein, president, Falk & Co., Pittsburgh, and S. R. Kaas, technical director, Atlas Refinery, Newark, N. J.

OTHER NRA NEWS

NRA is approving revised by-laws of the agricultural insecticide and fungicide industry which incorporate suggestions made by administration in earlier conditional approval of by-laws.—Committee of 7 is approved by bleached shellac code authority to handle trade practices complaints. Committee includes: Rudolph Zinsser, John T. Gillespie, James W. Byrnes, Ralph McClintock, Morris Rosen, Herbert M. Simon, and George A. Prochazk.

BUDGETS

Proposed budgets include lye industry, $7,960.75; insecticide and disinfectant manufacturing industry, $45,000; Fuller's Earth, $5,006.

Washington Briefs

Matthew Woll's suggestion for a board similar to the War Industries Board is receiving attention from industrial leaders as a way out of the present muddled state of affairs.—George N. Peek, special foreign trade advisor to President, suggests regulating outward flow of American capital to prevent excessive lending, and its subsequent interference with foreign trade.— George E. Tilley, Chairman of the M.C.A. tank car committee, Robert Marshall, J. C. Maguire and H. J. Gronemyer represented Association at ICC hearing Sept. 7 on specifications for tank cars and high pressure vessels.

Heavy Chemicals

¶ *Some Notable Price Declines Are Noted in September, While Tonnages Improve But Slightly*

Acetate of lime, acetic, and caustic potash are down and distinct rumblings are heards of higher di- and tri-phosphate schedules, but as yet definite prices are unavailable. As October opens, market gossip centers on '35 alkali prices. One group looks for early announcement to offset any possible suspicion on the part of the buyers that the entrance of one and the approximate entrance of a second new plant in southern territory into production will exert an unstabilizing influence, while the other group's guess is that the longer the prices are withheld and the shorter the contract season the less likely there is to arise undue competitive conditions. There is every reason to believe, however, that the alkali producers are looking at the situation from a very constructive viewpoint, and the general consensus appears to be that next year's contracts will be written at present figures.*

Lime producers, facing accumulating stocks and on the eve of the lift in seasonal production, initiated another 25c per 100 lb. reduction, effective the first of the month. This action was immediately followed by compensating reductions in acetic and the new schedule is as follows:

Grades	C/L Barrels per 100 lbs.	L/C/L Barrels per 100 lbs.	C/L Carboys per 100 lbs.	L/C/L Carboys per 100 lbs.
Commercial and/or Redistilled				
28%	$2.53	$2.78	$3.03	$3.28
56%	4.75	5.00	5.25	5.50
70%	5.91	6.16	6.41	6.66
80%	6.75	7.00	7.25	7.50
Pure				
30%	3.60	3.85	4.10	4.35
36%	4.05	4.30	4.55	4.80
60%	6.79	7.04	7.29	7.54
80%	8.54	8.79	9.04	9.29
Glacial 99½%	8.69	8.94	9.19	9.44

The above prices apply until further notice on contracts and open market and are delivered in most of the Eastern states with empty containers returnable at seller's expense. While there have been some accumulations of acid, due to the textile strike, definite reason for this decline is the lowering of lime.

Deep slashes in potash prices in the last 2 months makes it possible for domestic caustic potash producers to place in effect sizable declines. Importers are meeting this competition. A degree of stabilization appears on the horizon in the arsenate markets and lead arsenate is now quoted at 9c and calcium arsenate at 6c. A reduction of a ½c in white arsenic, first in 7 years, was a surprise in most quarters, but it is no secret that international stocks of basic material are getting larger rapidly.

Important Price Changes

ADVANCED

	Sept. 30	Aug. 31
Calcium arsenate	$0.06	$0.05
Sodium antimoniate	.10	.09½

DECLINED

Acid acetic, 28%	$2.53	$2.66
Proportionate changes in other grades.		
Arsenic, white	.03½	.04
Calcium acetate	2.25	2.50
Potash caustic,		
liquid, tanks	.02⅞	.03⅝
drums, c. l.	.03⅞	.03¾
l. c. l.	.03¾	.04
solid	.06¼	.07⅛
flake	.07	.0803
Tin tetrachloride	.25½	.26

TONNAGE IS BETTER

Modest improvement is in evidence in demand for chemicals. Specially is this true of the textile field where the intervention of the President's committee resulted in bringing peace to that troubled industry. A very slight improvement is reported in steel operations for most of the month, but a rather disconcerting decline is reported in the last week. Production in the automotive sections remains fair with September output estimated at about 175,000 units. Automobile companies are turning attention to new models for '35, however, and the balance of '34 is likely to see sharp production schedule reductions.

METROPOLITAN ALUM PRICES

Effective Sept. 14 a new alums schedule was placed in effect in the Metropolitan area as follows: Ammonia, granular, pea or nut, 25 bbls. and over, $3.40 per 100 lbs.; less than 25 bbls., $3.50 per 100 lbs.; lump, 25 bbls. and over, $3.65 per 100 lbs.; less than 25 bbls., $3.75 per 100 lbs.; powdered, 25 bbls. and over, $3.80 per 100 lbs.; less than 25 bbls., $3.90 per 100 lbs. Potash, granular, pea or nut, 25 bbls. or over, $3.65 per 100 lbs.; less than 25 bbls., $3.75 per 100 lbs.; lump, 25 bbls. and over, $3.90 per 100 lbs.; less than 25 bbls., $4; powdered, 25 bbls. and over, $4.05 per 100 lbs. and less than 25 bbls., $4.15 per 100 lbs. Bag packing is 20c per 100 lbs. lower than the above barrel prices.

BALTIMORE SULFURIC "FUMES"

From Baltimore come reports of sharp price rises in all grades of sulfuric and the market is said to be back on the price basis of '22-'23. While it has been generally understood that sulfuric prices in that important area have been unusually depressed, the rise at this time

* On Oct. 9 alkali prices for '35 were announced, same as those prevailing for '34; bichromate prices are as yet unknown; chlorine prices will be 15c. higher for '35.

in face of curtailed consumption in most fields was quite unexpected.

Although shipments to most of the heavy chemical consuming industries, such as tanning, glass, paints, etc., are not nearly as large as earlier estimates, chemical executives, generally speaking, appear encouraged at the end of the textile strike. October is usually one of the 2 best consuming months of the year and a backlog of orders is expected to be released this month. Most encouraging is the sustained retailed buying power reported in most sections of the country. Leaders reason that this cannot but have one effect-raising the level of activity in the so-called heavy indus- outlook for '35 appears to be one of tries.

As far as prices are concerned the firmness. With the general price commodity structure moving upward it could hardly be otherwise.

Methanol Statistics

Monthly statistics of crude and synthetic methanol, compiled by Bureau of the Census and Hardwood Distillation Industry Code Authority from 36 manufacturers, are presented. Statistics represent practically entire output of crude and synthetic methanol in the U. S. Manufacturers included in Bureau's summary on methanol for December, '33, accounted for 79.1% of the crude and 100% of the synthetic shown below.

Month 1934	Production (Gallons) Crude [1]	Synthetic
January	360,822	979,686
February	337,983	690,961
March	366,052	916,872
April	342,307	754,980
May	324,063	897,294
June	298,165	922,551
July	256,136	939,439
Total (7 months)	2,285,528	6,101,783

[1] The refined equivalent would be approximately 82 per cent of the crude production.

Heavy Chemical Notes

Salida Fluorspar, Salida, Colo., is opening up new deposit.—Mathieson's Lake Charles alkali plant is expected to be in production in December, being the 2nd of the 3 new Southern plants to start operations (Southern Alkali started in September). No reports are as yet available as to when Solvay's Baton Rouge plant will commence production. Latter will purchase steam and electric requirements from Louisiana Steam Generating Corp.

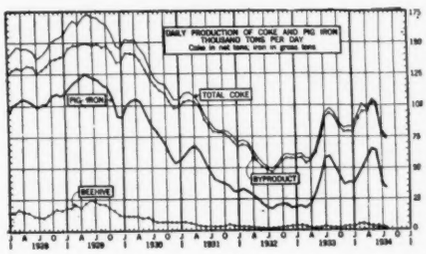
Less Cotton Oil

Choctaw Cotton Oil requests Oklahoma State Corporation Commission for permission to suspend operation at 49 cotton gins in 47 cities due to lack of business arising from decreased yield, the result of the drought.

Coal Tar Chemicals

¶ *Coke Production Declines Again — U. S. Dye Imports Heavier—Slow Demand for Coal Tar Chemicals*

For the 3rd consecutive month production of coke shows a declining tendency. Output of both beehive and byproduct during August amounted to 2,323,372 tons, or 75,157 tons per working day. This represents a decrease of 4.7% in comparison with July rate, and is 28.6% under year's high average of 105,305 tons recorded for May. Accumulated tonnage for '34 to the close of August is, however, 30.1% above corresponding period of '33.


DAILY PRODUCTION OF COKE AND PIG IRON
THOUSAND TONS PER DAY
PIG IRON
TOTAL COKE
BYPRODUCT
BEEHIVE
J A J O J A J O J A J O J A J O J A J O J A J O
1929 1930 1931 1932 1933 1934

Bureau of the Census

Output of byproduct coke for the month amounted to 2,279,672 tons, or 73,538 tons per day. Compared with July, August rate fell off 4.3%. Practically all of this decrease occurred at furnace plants, where daily average of 43,343 tons was 6.2% less than that of the preceding month. At merchant plants rate was 1.3% below that of July. A decline of 13.9% was reported in the pig iron industry.

Production of beehive coke continued to decline, average daily production for the month being 20.2% less than that of July. Stocks at byproduct plants continued to rise, total on hand at the end of August amounting to 2,648,085 tons, or 14.6% in excess of July's reserves.

August coal tar imports were less than August '33 figure, but advanced sharply over July of this year—69% in quantity and 91% in value. Figures: August, $489,000; July this year, $256,000; quantities advanced from 178,350 to 301,200 lbs. Increase is due in part to arrival of dyes that have not entered in recent months, but largely to heavier purchases of usual imports. In value, dye imports are about the same for the 1st 8 months of this year as last, when total reached $3,100,000—quantity has declined, however, from 3,160,000 to 2,125,000 lbs., indicating higher invoice prices due in part to exchange. Imports of aromatic chemicals continue to decline sharply.

Exports of coal tar and products during 1st half of '34 are valued at $7,400,000, an increase of 23½% over corresponding period of '33. Of this total, colors, dyes, stains and color lakes of coal tar origin accounted for $2,906,000, an increase of 44% in value and 19% in quantity compared with 1st half of '33.

WE BUY MORE FOREIGN DYES

U. S. August synthetic dye imports show a large advance over the preceding month of 122,829 lbs., and an increase in value of $233,039; total figure being 301,179 lbs., against 178,350 lbs., with a value of $489,252, against $256,213 for the previous monthly period. August imports of this year showed a decrease of more than 49% in pounds from the same month a year ago; also a decrease in value of more than 28%. Imports for the 1st 8 months of this year were 29% lower in volume than those for the same period a year ago, and 12% lower in value.

DEMAND IS MODERATE

Moderate improvement in call for dyes is reported. Featuring an other-

Coal Tar Statistics

	August 1934	August 1933	July 1934	Calendar yr. to date 1934	1933
Coking coal, by-prod. ovens	3,305,524	4,235,034	3,448,014	31,625,870	24,077,108
Stocks of coke, by-prod. ovens, tons	2,648,085	3,022,184	2,311,650	.....	.....
Coke production, by-prod., tons	2,323,372	2,994,018	2,432,159	22,344,878	17,171,685
Benzol production, gals.	4,844,000	7,157,000	5,120,000	47,997,000	38,831,000
Light oil production, gals.	.....	.....	10,137,161	.....	.....
Tar output, gals.	.....	.....	33,928,457	.....	.....
Ammonium sulfate, prod. tons	.....	.....	44,756	.....	.....
Coal tar exports, 000 omitted	.....	.....	.....	.....	.....
Coal tar imports, 000 omitted	$1,034	.....	$1,197	.....	.....

	August		July		June	
Imports	Quantity	Value	Quantity	Value	Quantity	Value
Creosote oil, gal.	2,416,595	$246,067	4,571,624	$419,605	2,686,656	$233,708
Cresylic acid, gal.	61,380	21,567	72,646	23,229	105,140	34,664
Naphthalene, crude, lbs.	2,930,520	42,334	5,961,191	83,671	3,698,274	54,117
Crude coal tar (bbl.)	24,831	50,007	14,752	24,209	7,650	13,651
Coal tar pitch (bbl.)	50	329	45	324	.....	.....
Other distillates, n.s.p.f.	21,070	1,715	55,427	1,337	67,322	1,931
Anthracene, crude	.....	.....	.....	.....	22,220	394
Benzol, gal.	.....	.....	.....	.....	4,939	691
Pyridine, gal.	.....	.....	.....	.....	93	277

wise quiet market, resin producers are said to be sharply increasing phenol demands. Better call is noted for benzol, and contract shipments of xylol are in good volume. Trading is still rather slow in naphthalene. Intermediates are still sluggish, but with the textile strike ended, this condition is expected to change momentarily. Prices in all divisions remain firm and revisions were relatively few and unimportant.

Ceramics

Almost a year ago the O. Hommel Co. of Pittsburgh founded an Industrial Fellowship at Mellon to investigate scientifically problems of importance in enamel technology. Jack H. Waggoner was appointed to the incumbency of this Fellowship, and since the inception of the work he has been studying broadly the applications of the frits produced by the O. Hommel Co. and has also been giving research attention to problems encountered in the industrial use of these products. Quite recently the Hommel Co. authorized Mellon to add another specialist to this Fellowship. William J. Baldwin is appointed to this post. Mr. Baldwin is a ceramic chemist who was educated professionally at the University of Buffalo (B.S., 1926) and was in the employ of the American Radiator at Buffalo from 1926 until he joined the Institute on Oct. 1.

NOTES OF THE INDUSTRY

J. H. Peck Clay Co., is a new clay company with mines at Gravel Pit, Ky. —Ohio Ceramic Industries Association meets at Lord Hall on the campus of Ohio State at Columbus, on Nov. 16-17. —Sale of chemical stoneware is reported on the increase by leading producers.—Henry H. Burg is now general sales agent on the Pacific Coast for Vitro (ceramic colors), with offices at 16 California st., San Francisco. M. O. Grove will call on northern California trade out of the San Francisco office, while R. R. Hazeltine, 440 Seaton st., Los Angeles, will take care of southern end of the state.—Plans for the Conference on Glass Problems to be held at the Dept. of Ceramic Engineering, University of Illinois, Urbana, Nov. 2 and 3 are being perfected.

Rubber

Chicago A. C. S. Rubber Group hears Heveatex Corp. president, J. B. Crockett on "Rubber in Powder Form," at the fall dinner meeting, Oct. 5. N. Y. City group will hear W. B. Wiegand, Binney & Smith, tell on Oct. 19 at the clubhouse of the Building Trade Employers Association, 2 Park ave., N. I. City, his experiences on his recent world trip.

Fine Chemicals

¶ *Seasonal Items in Demand—Benzoic Acid and Iodides Lower*

With the season of watery eyes and running noses again at hand, seasonal drug items show definite signs of volume improvement, while general trading remains quiet. However, the last 10 days of September are reported as showing a definite trend in the upward direction in the call for fine chemicals, albeit rise is a slow one.

Benzoic acid and the benzoate are higher; glycerine is up a ½c with demand improving seasonally; mercury is off 50c a flask; more important iodides and potash and sodium iodates are off from 5 to 10c a lb.; both pharmaceutical and technical grades of calcium gluconate are "upped" 3c.

New lower quotations on iodides (expected since the recent decline in crude iodine) are as follows:—Ammonia, $3.40 to $3.45 per lb.; arsenous, $5.15 to $5.20; barium, $4.40 to $4.45; cadmium, $3.45 to $3.50; calcium, $3.80 to $3.85; copper, $4.97 to $5.02; ethyl, $5.55 to $5.60; iron, $2.95 to $3; lead, $2.40 to $2.45; lithium, $4.45 to $4.50; manganese, $5.20 to $5.25; mercury, U.S.P., red, $3.60 to $3.65; yellow, $3.70 to $3.75; starch, $1.87 to $1.92; strontium, $2.85 to $2.90; sulfur, $3.80 to $3.85; thymol, $3.75 to $3.80; zinc, $4.10 to $4.15; bismuth subiodide, $4.03 to $4.08; potash iodate, $3.20 to $3.25; soda iodate, $5.02 to $5.07.

Domestic Iodine

Iodine, a product which until recent years the U. S. obtained almost entirely from foreign countries, is now produced in appreciable volume from domestic sources. Chile has been the chief foreign source of supply where it is obtained as a by-product of nitrate manufacture while a certain amount has been imported from Japan where it is extracted from seaweed.

Until 1928 only small quantities of iodine had been produced in the U. S., but during that year production from oil-well brines began in California and Louisiana and gradually reached marketable quantities.

As production increased imports declined, dropping rapidly from 926,500 lbs. valued at $2,900,000 in '27 to the low point of 278,700 lbs. valued at $998,000 in '31. Notwithstanding this decline the invoice price of imports increased from $3.13 to $3.58 per lb. Following '31, however, invoice price began to decline, dropping to $3.52 in '32, and imports rose to 631,670 lbs. During the year following average import invoice price dropped to $2.08 per lb. and imports advanced to 1,411,680 lbs., the largest amount ever brought in during a single year. Receipts continue heavy amounting during the 1st 7 months of '34 to 1,243,500 lbs., valued at $1,867,500 or about $1.50 per lb.

Important Price Changes

ADVANCED

	Sept. 30	Aug. 31
Acid benzoic, U.S.P....	$0.54	$0.53
Calcium gluconate, phar.	.57	.54
Tech.	.28	.25
Glycerine, C.P., drums.	.14	.13½
Cans	.16	.15½
Sodium benzoate	.46	.45

DECLINED

Mercury $74.00		$74.50
Mecurials, iodide, yellow	3.70	3.80
Red	3.60	3.70

F.T.C. Serves Bayer

Bayer is served by Federal Trade Commission with an order to cease and desist from unfair competitive practices in sale of its aspirin. Company refrained from contesting Commission's proceeding and consented to issuance of a cease and desist order. For complete review of specific complaint, CHEMICAL INDUSTRIES, July, p. 55.

Dry Ice Uses

Society for Dry Ice Research is conducting experiments at Wurttemberg designed to produce rain by scattering ground dry ice from aeroplanes above the clouds. Other novel uses include: Freezing quicksand when encountered in building excavations, extinguishing fires in underground electrical conduits, freezing golf ball cores before wrapping, dewaxing oils, and fumigating in grain elevators. In the U. S. approximately 90% is taken by the ice cream industry.

Houses supplying chemical specialties to textile field who have contracted for space at the Southern Textile Exposition, at Greenville, S. C., Oct. 15-20, include: Borne-Scrymser, Corn Products Sales, Draper Corp., du Pont paint and varnish division, E. F. Houghton & Co., International Salt, Keever Starch and N. Y. & N. J. Lubricant.

Also Penick & Ford, Permutit, Sherwin-Williams, Staley Sales, Standard Chemical Products, Standard of N. J., Stein-Hall and Swan-Finch.

Paints, Lacquers and Varnish

¶ *Paint Sales Remain Slow Despite HOLC — Construction Figures Are Disappointing*

Despite a wealth of newspaper ballyhoo about the benefits being derived from operation of the National Housing Act, raw paint material supplies are not experiencing any tremendous surge forward in tonnage volume, and present orders from paint producers are still largely of a replacement nature. In all justice it should be said that as yet too short a period has gone by for the paint industry to reflect in large volume the anticipated benefits, and in many authoritative quarters the opinion is expressed that the turn of the year will be passed before definite increases will be noted.

Aside from some revisions in the varnish gum schedules outstanding price changes were net losses in carlot quotations for red lead and litharge and a ½c advance in Spanish red oxides. Lead remains weak even after 2 price dips in September. Casein is another item with net price declines in the last 30 days.

Important Price Changes

ADVANCED

	Sept. 30	Aug. 31
Red Spanish oxide.....	$0.04⅛	$0.03⅝

DECLINED

Lead, red, dry, c. l.....	$0.061	$0.062
Litharge, c. l.	.052	.051

DEPT. OF LABOR INDICES

	Aug. '34	Aug. '33	July '34
Employment	98.2*	93.5	101.2a
Payrolls	76.9*	69.8	78.8a
Prices	79.9	77.5	79.8

* Preliminary; a revise.

CONSTRUCTION FIGURES

Construction contracts placed during August were slightly higher than those reported for July and 13 per cent greater in volume than the total shown for August, 1933, according to F. W. Dodge Corp. Out of the August 1934 volume of $120,244,500 a total of $51,046,800 was reported for non-residential building types; $41,905,900 for public works; $18,641,000 for residential buildings; and $8,650,800 for public utilities. August totals for non-residential building and public works classifications were larger than in August, '33, while for residential building and public utilities respective totals were smaller than a year ago. For both residential and non-residential building August totals were smaller than those reported for July.

September figures, of course, are still unavailable as this is written, but they are expected to show continuance of this improved trend. Nevertheless, total figures are still very disappointing, and when compared with those of 3 or 4 years ago indicate quite clearly how little the building field has yet contributed towards recovery.

BABSON OPTIMISM

A more optimistic note for the future is sounded by Economist Babson, speaking before the Massachusetts Cooperative Bank League. He expects 1,000,000 new small homes will be built within the next few years and sees the home of today completely obsolete in 1944.

Lacquer sales remain fair. September automotive output is reported approximately 175,000 units. This is the first month in '34 to fall below the corresponding month a year ago, the loss totalling about 11.4%.

A number of important lacquer solvents and plasticizers are higher in price. These are treated in more detail under "Solvents and Petroleum Chemicals" Section. Sufficient to say that here that higher manufacturing costs now face lacquer producers and upward revision in prices for finished lacquers is not a remote possibility by any means.

Replacement Costs

Market Replacement Costs Bulletin, effective Sept. 17, until the issuance of the next schedule, issued by authority of the Paint Industry Recovery Board, Inc., which has been mailed to the members of the Paint, Varnish and Lacquer Manufacturing Industry, carries a special message from President Trigg in reference to the operation of the National Housing Act for the industry in relation to the Code.

Code Interpretations

The Code Bulletin issued by the Paint Industry Recovery Board, Inc., which has just been mailed to the members of the Paint, Varnish and Lacquer Manufacturing Industry, carries numerous interpretations of importance. Copies are available from the offices of the Board at 2201 N. Y. Ave., N. W., Washington.

Novel Paint Use

A new plan, which is being given publicity both in local and in Boston newspapers, with the purpose of giving work to unemployed, is launched in Lawrence. House and store street numbers are being painted on sidewalks in front of properties. *Boston Globe* reports that materials for work are purchased and that workers in Lawrence are paid by occupants of properties accepting the service. This is a development of practices which have been tried out in other cities, and which included painting of street names as well as numbers, on curbs.

23.68% Is For Paint

According to a special analysis of loans made thus far under the National Housing Act by the Washington Bureau of the *N. Y. Herald-Tribune*, interior and exterior painting jobs aggregate 23.68% of the jobs for which insured loans are being obtained. This record easily leads all other classes of jobs in the analysis.

Paint Personnel

Frank F. Whittam, John Lucas Philadelphia branch manager for 6 years, is in charge of sales as general sales manager. H. Hilton holds similar position now with Sapolin. He was formerly with Valentine.—L. A. Davidson resigns after 11 years with Ohio Varnish, Cleveland, to go with Davies Can. He resigns secretaryship of Cleveland P. V. & L. A.—E. C. Hyland, P. P. G. manager, industrial paint sales in Milwaukee, is now assistant to director of sales, F. W. Judson.—J. E. Anderson of same company is now on the staff of general paint manager in Pittsburgh and Dr. W. W. Bauer is now assistant research director. Joseph Verderosa is named a service engineer.—P. L. Swisher of O'Brien Varnish accepts sales managership of Beck, Koller to succeed the late E. S. Dickens.

Paint Companies

S.-W. is member, Association of National Advertisers, with Publicity Manager C. M. Lemperly representing company.—Creo-Dipt, North Tonawanda, N. Y., is being reorganized by H. P. Kendall, Jr.— Valspar is now featuring its self-stirring can (reported and illustrated in an earlier issue of CHEMICAL INDUSTRIES) in all of its advertising.—Pittsburgh Plate Glass president, H. S. Wherrett, reports, "Building construction industry, normally an important outlet for our glass and paints, is still operating at an extremely low level and any direct benefits which are to be had from the National Housing Act, the Federal Building Program and other activities sponsored by the Government will not reach our industry until after the 1st of the year."—F. E. Schundler & Co., nonmetallic minerals, is opening a new and larger plant for eastern activities in Long Island City.—Aluminum Co. of America is mailing out a new booklet on aluminum paints and their uses.—

Devoe & Raynolds is expected to earn about $5.50 this year.

Paint Personals

A. E. Horn, treasurer, A. C. Horn Co., is chairman of Queens Borough Committee, Better Housing Campaign of the Federal Housing Administration.—Z. E. Martin, president, Martin-Senour, Chicago paint manufacturer, is surprised at testimonial dinner celebrating his 50 years of service to the company and the industry.

DEAD

Richard H. Lersner, 55, president, Chilton Paint, College Point, L. I., suddenly of a heart attack.

Fall Paint Plans

Fall Clean Up—Paint Up—Fix Up Campaign (promoted by the National Clean Up and Paint Up Campaign Bureau in Washington, in co-operation with the National Fire Protective Association) is under way, and demands upon the Bureau reflect unusual enthusiasm. In many communities, the Clean Up—Paint Up—Fix Up Campaign will operate as an important vehicle for promotion of Better Housing Program of the Federal Housing Administration, and will be especially emphasized during National Fire Prevention Week, Oct. 7-13, when special attention will be given to cleaning up, painting up and repairing of property as a practical measure of protection against fire.

Associations

J. V. Thompson, vice-president and director of sales of Thompson & Co., heads the Pittsburgh Paint, Varnish & Lacquer Association. Other officers are vice-president, Hugh Conley, Eagle-Picher Lead; treasurer, H. V. Natcher, T. H. Nevin Co. George F. Smith is again secretary-treasurer—N. P. V. & L. A. president, Ernest T. Trigg spoke at the business meeting.—C. K. Stodder again heads the Paint & Oil Club of New England.—E. J. Russell, Rasmussen & Co., is president of the Paint, Oil & Varnish Club of Portland, Ore.—F. M. Paul is now acting secretary of the Cleveland P. V. & L. Association.—Synthetic Resin Manufacturers' Association meets at the Pine Valley Club, Clementon, N. J.—Paul E. Warling, chemist of Thomas & Hochwalt Laboratories, Dayton, is guest speaker at the October meeting of the Chicago Production Club. His talk—"Sharples Process for Manufacturing Lacquers."—George W. Lynch, new president, and other new officers of the New England Paint and Varnish Production Club, hear reading of paper on "Protective and Decorative Coating on New Concrete Floors."

THAT FIRST CONVENTION

Reservation cards for coming Washington paint convention are mailed to industry members. President Trigg, in letter to members of N. P. V. & L. A., reports continuance by NRA of its approval of processing and packaging costs with loss factors.—Cincinnati-Dayton-Indianapolis Paint & Varnish Production Club members will select officers at October meeting from following slates: For president, W. M. Friskhorn and W. L. Kirkpatrick; for vice-president, W. W. Burr and O. Kinder; for secretary, A. Grosser and Robert J. Smith, and for treasurer, A. N. Masse and Charles Hyatt.—E. P. Lynch, of E. P. Lynch, Inc., Providence, R. I., is elected chairman of code authority for Wholesale Paint, Varnish, Lacquer, Allied and Kindred Products Trade at meeting Sept. 14 in Washington.—R. M. Reed, Western Dry Color, speaks before crowded meeting of Chicago Production Club. At recent A. C. S. Cleveland meeting, paint and varnish chemists select as leaders: Wayne R. Fuller, Pratt & Lambert, chairman; E. W. Boughton, R. T. Vanderbilt, chairman-elect; Roy H. Kienle, Calco Chemical, secretary-treasurer.—Early reports already indicate that annual convention of National Paint, Varnish and Lacquer Association, scheduled for the Mayflower, Washington, Oct. 31-Nov. 1, 2, will see largest gathering in history of the industry. First annual convention for N. P. V. & L. A., but 47th annual meeting of organized industry will live long in memory of industry's members, is promise from Association headquarters at 2201 N. Y. ave., N. W. Washington, given through President Trigg.

New Wall Paint

"Mural-Tone" is a new wall paint now being distributed by the Muralo Co., Staten Island.

Linseed Oil

Dept. of Agriculture estimate Sept. 1 of the flax yield is only 5,253,000 bu., and it now appears almost certain that this year's crop will be the lowest ever recorded. Sept. 1 condition (35.1%) is 2nd lowest on record. Drought and withering temperatures, especially in important flaxseed states, Dakotas and Montana, took a heavy toll and were followed late in August by frost damage. Detailed statistics are given on this page.

CANADIAN ESTIMATES

On Sept. 11 Canadian official estimate was released and it places this year's production of flaxseed in Prairie Provinces at 1,023,000 bu., compared with 563,000 produced a year ago. This year's acreage was placed at 218,400 as against 235,900 a year ago. Report states further that the Prairie Provinces experienced a very unfavorable growing season, with large areas affected by drouth, soil drifting, extreme heat, pests, hail and frosts. Canadian crushers will be forced to import flax and will probably buy in Argentina.

Reports from the Argentine are favorable as to weather conditions. Early in the month it was feared that some damage would occur from frosts, but later advices are to the effect that little damage could be detected.

FLAXSEED MARKETS

Flaxseed prices are down when compared with the close on Aug. 31 as the following comparison indicates:

	Minneapolis		Duluth	
	Aug. 31	Sept. 29	Aug. 31	Sept. 29
Dec.	$1.91½	$1.83	$1.92½*	$1.84

* Asked.

Buenos Aires market closed at $1.11⅛ against $1.18¼ on Aug. 31, showing a net loss for the 30 day period.

LINSEED LOWER

Following the decline in the flaxseed markets, linseed is off from the Aug. 31 close. The Sept. 29th price of 8.5c in tanks compares with 8.9c at the end of August, and reflects poor demand for linseed as well as the decline in the flaxseed markets. Cake and meal are down, former to $30.00, and the latter to $38.50 a ton.

Flaxseed Crop Outlook September 1

	Condition Sept. 1 (per cent)			Bushels		
				Harvested		
	10-yr. aver., 1922-31	1933	1934	5-yr. aver., 1927-31	(Revised) 1933	Estimated 1934
Wisconsin	82	71	72	92,000	40,000	50,000
Minnesota	79	49	46	6,241,000	4,365,000	3,480,000
Iowa	83	60	52	184,000	196,000	156,000
Missouri	78	70	15	15,000	11,000	5,000
North Dakota	65	35	18	7,351,000	1,677,000	830,000
South Dakota	65	15	14	3,065,000	115,000	100,000
Nebraska	77	65	1	91,000	12,000	4,000
Kansas	6.2*	6.2*	5.5*	215,000	223,000	286,000
Montana	61	26	17	1,329,000	162,000	98,000
Wyoming	73	38	10	81,000	5,000	4,000
California	..	..	20.0*	.....	.....	240,000
United States	68.0	41.6	35.1	18,664,000	6,806,000	5,253,000

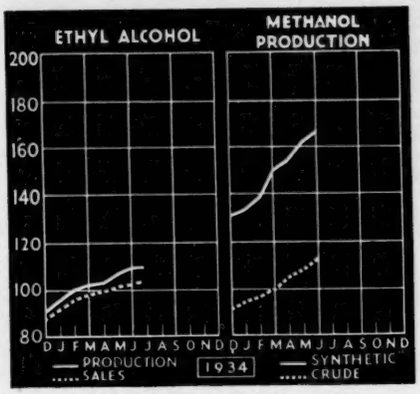
* Yield per acre.

ADVERTISEMENTS—*Each article on this page is a paid advertisement.*

SOLVENT NEWS

Reg. U. S. Pat. Off.

OCTOBER ★ A Monthly Series of Articles for Chemists and Executives of the Solvent-Consuming Industries ★ 1934



(*moving twelve-month averages,* 1931 = 100)

CURRENT PRODUCTION

		1934	1933
ETHYL ALCOHOL			
1000	Jan.-July .	92,788	73,859
proof	July . .	13,702	11,684
gals.	June . .	12,998	10,683
Sales			
1000	Jan.-July .	78,970	56,954
proof	July . .	12,693	9,345
gals.	June . .	10,759	9,471
METHANOL			
Crude	Jan.-June .	2,029	1,376
1000	June . .	298	179
gals.	May . .	324	185
Synthetic	Jan.-June .	5,162	2,206
1000	June . .	923	559
gals.	May . .	897	366

ALCOHOL FISCAL REPORT SHOWS MARKED GAINS—METHANOL UP

Publication of the figures for June completed the fiscal year for ethyl alcohol and shows that production at industrial alcohol plants amounted to 165,106,618.94 proof gallons compared with 115,609,754.29 proof gallons for the preceding year and 146,950,912.76 proof gallons for the fiscal year ended June 30, 1932.

Production of denatured alcohol for these fiscal years was 82,240,853.58 wine gallons for 1934, 61,600,346.70 wine gallons for 1933, and 78,329,517.34 wine gallons for 1932.

Current production figures on methanol, recently released for the first six months of this year also make an exceedingly favorable comparison with the like 1933 period.

EXPORTS AID SOLVENT CONSUMERS

Many of the major solvent consuming industries are among the manufacturers to benefit from the increased exports of chemicals and related products which have been stimulated by favorable exchange rates and improved conditions abroad.

According to the Department of Commerce, industrial chemical exports for the first six months of this year increased in value 45% over the first half of 1933. Other gains include: synthetic resins, approximately 100%; pyroxylin products, 92%; industrial explosives, 40%; paints, pigments and varnishes, 37%; naval stores, gums and resins, 17.5%; and industrial chemical specialities, 21.5%.

ETHYL ACETATE OFFERS MAJOR ADVANTAGES AS A SOLVENT FOR NITROCELLULOSE LACQUER

Ethyl acetate has maintained its position as a basic solvent in the manufacture of nitrocellulose lacquers due to two primary advantages: lower price, and superior solvent characteristics.

Ethyl acetate, having the advantage of lower raw material costs, can be offered at a more economical price than most of the higher boiling ester solvents. In addition to the cost factor, ethyl acetate offers several decided advantages over some of these more expensive solvents.

In the manufacture of nitrocellulose lacquers it is customary to use some higher boiling solvents such as amyl acetate and butyl acetate, along with the ethyl acetate. A certain amount of slower evaporating solvents is necessary to prevent blushing and enable the lacquer to flow out and produce a smooth surface. However, it is to the interest of the lacquer manufacturer to see that ethyl acetate constitutes as large a proportion as possible of the active solvent mixture.

Advantages other than lower cost offered by ethyl acetate are: milder odor, lower solution time, lower viscosity, and greater toluol tolerance.

It is obvious that odor and speed of solution are important to the lacquer manufacturer.

Moreover, in the production of lacquers, it is most desirable to use solvents which yield low viscosity solutions. When 10% solutions of dry half-second R. S. Nitrocellulose are made with ethyl acetate 85-88%, normal butyl acetate 90-92%, commercial amyl acetate and secondary amyl acetate, the viscosities of these solutions expressed in centipoises are 32, 43, 57 and 75 respectively—thus indicating a substantial low viscosity advantage in favor of ethyl acetate.

If toluol is used as the diluent, the toluol tolerance of nitrocellulose solutions made with the various solvents is important since the amount of this low

(*Continued on next page*)

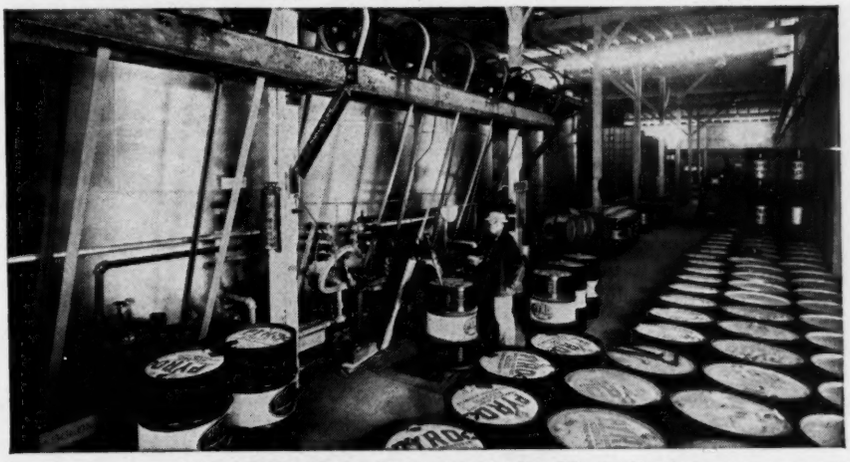
NEW U. S. I. DENATURING PLANT AND WAREHOUSE IN CHICAGO WILL SUPPLY MIDDLE WEST

With the opening of a new denaturing plant and warehouse in Chicago on August 15th, the U. S. Industrial Alcohol Co., is in a position to extend additional service facilities to the large number of alcohol consuming industries throughout the middle west. This new plant will serve as a major supply base for the entire middle western area on all products manufactured and sold by U. S. I.

A corner of the new Denaturing Plant and Warehouse showing the location of the plant office and the loading platform for handling of local deliveries by Company owned trucks.

A completely equipped denaturing plant for the production of all authorized specially and completely denatured alcohol formulas is available. Another section of the plant provides bonded storage facilities for carrying bulk stocks of pure ethyl alcohol which are

(*Continued on next page*)



An interior view of the new U. S. I. Chicago Denaturing Plant. The large storage tanks shown at the left hold stocks of the denatured alcohols and solvents used in large commercial quantities. Ansol PR, Ethyl Acetate, Butyl Acetate, Anhydrous Alcohol and Solox are among the products stored in bulk for immediate shipment. An automatic filler for the standard containers is shown in the center.

Published Monthly by the U. S. Industrial Chemical Co., Inc.

OCTOBER ★ **SOLVENT NEWS** ★ 1934

ADVANTAGES OF ETHYL ACETATE AS A LACQUER SOLVENT

(*Continued from preceding page*)

priced product which can be added, influences the final cost of the solution materially. The toluol dilution ratio for a nitrocellulose solution made of ethyl acetate 85-88% and enough half-second R. S. Nitrocellulose to give a nitrocellulose content of between 7 and 9% at the end point, is 3.5. Under the same conditions the dilution ratio for normal butyl acetate is 2.9; for commercial amyl acetate 2.7; and for secondary amyl acetate 2.1. Therefore, it can be seen that even if the same price were paid for all these solvents, ethyl acetate would have the advantage in cost when the nitrocellulose solutions were diluted as much as possible with toluol.

Since ethyl acetate costs less per pound and per gallon, and possesses other desirable features, it is obviously advisable to increase the proportion of this solvent in lacquers.

NEW U. S. I. DENATURING PLANT AND WAREHOUSE IN CHICAGO

(*Continued from preceding page*)

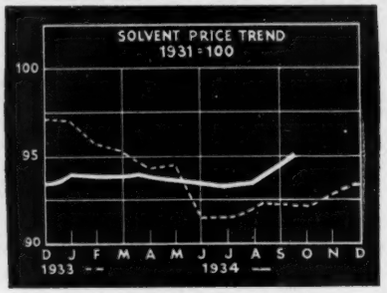
supplied direct from the two largest U. S. I. manufacturing plants at Baltimore and New Orleans.

A full line of chemicals and solvents manufactured by the U. S. Industrial Chemical Co., Inc., as well as a complete range of completely denatured and specially denatured alcohols will be kept on hand or made up to order on short notice. As the capacity of the plant is only limited by the time required for the actual denaturing and mixing operations, U. S. I. will be able to give prompt delivery in the entire area on any commercial quantity of its products.

Operations of the plant, which were started coincident with its completion on August 15th, are under the supervision of F. J. Rich, who was formerly in charge of U. S. I's. grain alcohol plant at Peoria, Ill. Complete in every detail, the actual denaturing operations are carried out in eleven large denaturing tanks and the addition and proportioning of the denaturants are under the same rigid control exercised in all U.S.I. plants. Filling equipment for the handling of small packages is automatically controlled, filling the containers by weight to eliminate the possibility of error.

Local deliveries within the Chicago industrial area are made by Company owned trucks. Rail connections direct to the plant are employed in making shipments to more distant points.

Thus, aside from being an important factor in the efficient distribution of the Company's products, the new plant will enable U. S. I. to render superior service to this large industrial and manufacturing market.



SOLVENT PRICE TREND

Important upward revision of prices on a large number of solvents and diluents for fall quarter delivery was recorded September 15th and advanced the index number for that date to 95.18, the highest level reached since March 1933. This compares with the figure of 92.81 for the preceding 30 day period.

Acetone. Amyl Alcohol, Technical and Secondary Amyl Acetate, Normal and Secondary Butyl Acetate, Normal and Secondary Butyl Alcohol and Diamyl and Dibutyl Phthalate were among the solvents on which the price was advanced.

Production and shipments of cellulose acetate plastic products both showed a marked increase for the first six months of 1934 as compared with the same period of 1933. Figures recently released by the U. S. Department of Commerce report shipments of sheets, rods and tubes for the 1934 period of 2,559,486 pounds compared with 1,056,155 pounds for the corresponding period of 1933.

TECHNICAL DEVELOPMENTS

Continuous centrifugal operation is now possible with a newly developed machine. It feeds, separates and discharges continuously and automatically.

U S I

The amount of stretch in paper when tested to the breaking point may be measured by a new instrument. All grades of paper may be tested and the device is especially useful in testing papers that are to be corrugated, embossed, or hot or cold pressed.

U S I

Undercoats for nitrocellulose leather finishes recently introduced are composed of latex mixed with methyl cellulose, casein, albumin, etc. Another formula suggests the use of a rubber-shellac mixture. It is necessary that the non-rubber components predominate to insure proper adhesion of the nitrocellulose.

U S I

Non-soluble, non-corrosive, non-oxidizing and never hardening are among the properties claimed for a new sealing compound. Supplied in paste form, it is suitable for use with gaskets or as a seal for flanged or threaded pipe joints.

U S I

A product having the character of transparent paper is produced by submitting extremely fine particles of carbohydrates or polysaccharides to a swelling process, spreading in thin layers and drying. The process is covered by a French Patent.

U S I

Oxidized colophony, which in alcoholic solution is said to be useful as a solvent for nitrocellulose, is being produced on a commercial scale in the U.S.S.R. It is reported that when oxidized colophony is used in nitrocellulose lacquers, other plasticizers as well as high boiling solvents can be eliminated.

U S I

Clouding of linseed oil on conversion into stand oil (after preliminary elimination of mucoid and albuminoid substances) is due to the presence of traces of fatty acids according to a recent investigation. Although clouding does not affect the qualities of stand oil, it is thought these observations may be turned to account in other directions.

U S I

A rust remover which is said to loosen rust so that it can be washed off leaving the steel or iron clean and bright, is now on the market. In paste form, it has the quality of remaining moist and active for 24 hours, and is said to penetrate all crevices and remove fine particles leaving the surface in excellent condition for painting.

U S I

A new small electric heating unit, made of monel metal is said to be particularly useful in heating linseed oil for use in the manufacture of varnishes, inks, etc., as it will not stain the oil. Other similar units are made in lead and copper sheathed coils for specialized uses such as pickling and plating baths, where corrosion of the metal surface of the heater must be avoided.

U.S.I INDUSTRIAL ALCOHOL CO.
INDUSTRIAL CHEMICAL CO., INC.

WORLD'S LARGEST PRODUCERS OF ALCOHOL DERIVED SOLVENTS

ALCOHOLS
Amyl Alcohols
Refined Amyl Alcohol
Refined Fusel Oil
Secondary Amyl Alcohol
Ethyl Alcohols
Specially Denatured—All Formulas
Completely Denatured—All Formulas
Anhydrous—Denatured
Absolute—Pure
C.P. 96%—Pure and Denatured
Solox—The General Solvent
Super Pyro—The Rustproof Anti-freeze
Pure (190 Proof)—Tax Paid, Tax Free

ALCOHOLS
Butyl Alcohols
Normal and Secondary
Methyl Alcohol

ANSOLS
Ansol M
Ansol PR

ETHERS
Ethyl Ether
U.S.P. and Absolute (A.C.S.)

NITROCELLULOSE SOLUTIONS
Collodions
U.S.P., U.S.P. Flexible and Photo
Cotton Solutions

ESTER SOLVENTS
Acetic Ether
Amyl Acetates
High Test
Commercial
Technical
Secondary
Butyl Acetates
Normal
Secondary
Diatol
Diethyl Carbonate
Estersols
Ethyl Acetates
85-88%, 99%, and U.S.P.
Ethyl Lactate

PLASTICIZERS
Diamyl Phthalate
Dibutyl Phthalate
Diethyl Phthalate
Dimethyl Phthalate

OTHER PRODUCTS
Ethyl Acetoacetate
Ethyl Chlorcarbonate
Ethyl Oxalate
Ethylene
Sodium Oxalacetate
Acetone
Methyl Acetone
Curbay Binder
Potash By-products

Executive Offices: 60 East 42nd Street, New York, N. Y. Branches in all Principal Cities

Solvents, Petroleum Chemicals

What Higher Corn Did

A sweeping upward revision of prices for a number of more important solvents (and plasticizers) was made Sept. 15, effective October 1. Because of the spectacular advance in corn and other grain markets in the past months, such action has been fully anticipated. Following is the new schedule now in effect for 4th quarter business:

	Tanks	C.L.	L.C.L.	5 gal. cans	1 gal. cans
Butyl Alcohol..	13c	14c	14½c	17c	20c
Butyl Acetate..	13	14	14½	17	20
Butyl Lactate..	..	..	23½	26	29
Butyl Stearate.	..	..	26	29	32
Butyl Aldehyde.	..	19	21	24	26
Butyl Acetyl Ricinoleate ..	..	..	25	28	31
Butyl Oleate...	..	..	26	29	32
Dibutyl Ether...	..	..	31	34	37
Dibutyl Phthalate ...	21½	..	23	25	28
Dimethyl Phthalate ...	..	..	24	25½	28½
Diacetone, tech.	17	18	18½	21	24
Diacetone, A.F..	18	19	19½	22	25

Above prices are f.o.b. seller's plant, freight allowed to destination, drums included and non-returnable. There is no freight allowance on 5 and 1 gallon cans nor on butyl adehyde, butyl acetyl ricinoleate, butyl oleate. Terms are net 30 days and contract prices are in each case 1c per lb. lower.

ACETONE 1c HIGHER

Acetone, dimethylamine and monomethylamine schedules are now as follows:

	Tanks	C.L.	L.C.L.	5 gal. cans	1 gal. cans
Acetone	12c	13c	13½c	16c	19c
Dimethylamine..	..	95	$1.10	$1.20	$1.35
Monomethylamine ..	75	90c	1.00	1.15	

These prices are f.o.b. seller's plant freight allowed to destination, drums extra and returnable for credit, freight collect. No freight allowance is made for either dimethylamine or monomethylamine. Terms are net 30 days and a 1c differential is made in acetone on contracts. Carlot prices for dimethylamine and monomethylamine prevail for l.c.l. quantities, providing equivalent of a car is taken in a 4 months period.

ETHYL ACETATE 7½c IN TANKS

Ethyl acetate is now quoted at 7½c in tanks, 8½c in carlots, 9c for l.c.l. quantities, 12½c for 5 gal. cans, and 15½c for 1 gal. cans, freight allowed to destination, drums included and non-returnable, terms net 30 days.

In all cases above 1c is added for delivery in 5 or 1 gal. cans ex-warehouse and no freight allowance is made on cans.

No change was reported in the published quotations of any of the important petroleum solvents. Leading producers report firm prices in the face of light demand for most items. Lacquer diluents continue to move out satisfactorily and improvement is reported on volume of shipments of Stoddard Solvent. Demand from the rubber field, however, dropping off at a fairly rapid rate and is expected to continue this trend to the end of the year.

Important Price Changes
ADVANCED

	Sept. 30	Aug. 31
Acetone, tanks*	$0.11	$0.10
Alcohol, butyl, tanks*..	.12	.10½
c. l., drums*	.13	.12
l. c. l.*	.13½	.11½
secondary, tanks	.096	.076
Amyl acetate, secondary, tanks	.108	.09

* Spot prices 1c higher.

Solvent Companies

Sharples Solvents is offering mixed amyl chlorides (chlorinated solvent) stabilized with olefin at a very attractive price of 35c a gal. in tanks, delivered east of the Mississippi.—U. S. I. opens a new denaturant plant and warehouse in Chicago to take care of the mid-west area.

Sharples Solvents is now quoting diamyl ether at 9c in l.c.l. quantities.

Naval Stores

Markets Routine

Naval stores markets were strictly routine affairs in the past month. Some minor excitement appeared about the middle of the month when a light flurry of inquiries for export came into the market, but this soon subsided and trading again turned slow. Japan is reported as buying fairly sizeable quantities. Actual price changes were small and of little importance. Turpentine lost a ¼c net in the 30 day period, closing at 41¼c, while changes in rosin at Savannah are indicated in the following comparison:

	Aug. 31	Sept. 29	Net Gain or Loss
B	$4.10	$4.10	.....
D	4.10	4.20	$+0.10
E	4.25	4.20	— .05
F	4.25	4.20	— .05
G	4.25	4.25	.....
H	4.25	4.25	.....
I	4.25	4.30	+ .05
K	4.35	4.30	— .05
M	4.40	4.35	— .05
N	4.65	4.60	— .05
WG	4.90	4.90	.....
WW	5.10	5.15	+ .05
X	5.10	5.25	+ .15

Stocks continue to accumulate at primary ports, but this does not appear to be exerting any undue influence at the moment on the market. There is no way of knowing how large the stocks are that are Government financed. Greater harmony now appears to exist among different groups in the industry over the question of control measures. Stocks statistics follow:

Stocks of Rosin	Savannah	Jacksonville
Aug. 31	127,414	72,020
Sept. 29	135,897	85,641
Net gain or loss....	+8,483	+13,621
Stocks of Spirits Turpentine		
Aug. 31	13,713	29,658
Sept. 29	11,802	35,574
Net gain or less....	—1,911	+5,916

Control Agencies

Control Committees of the Naval Stores Factors and Dealers met in joint session at Brunswick Sept. 20. Two committees are composed as follows: Factors: O. T. McIntosh, D. A. Sapp, H. M. Wilson, H. A. Lurton, T. J. Taylor; Dealers: C. T. Theus, J. A. Myers, Porter Mackall, A. E. Adamson, A. E. Lucas. In addition present were: Carville H. Carson as an alternate, Geo. T. Rives as an observer, and Carl F. Speh, executive secretary, Producers Control Committee.

Factors Control Committee elected O. T. McIntosh, of Southern States Naval Stores, of Savannah, as chairman, and Mrs. S. E. Armistead, of the Consolidated Naval Stores Co., Jacksonville, as secretary-treasurer. Arrangements were made for covering a small budget for the Control Committee's necessary expenses.

Factors Committee appointed H. M. Wilson, of Jacksonville, as its representative, and the Dealers Control Committee appointed Mr. Lucas as its representative, to meet with Producers' Control Committee to formulate rules and regulations for proper tagging of naval stores at interior points.

HIGHER LOAN BASIS?

Reports persist, according to the *Savannah Weekly Naval Stores Review,* that the efforts to secure a higher

August production of naval stores by steam distillation and solvent treatment of wood and stocks of these products on hand Aug. 31, according to data collected by producers' committee, through Arthur Langmeier, of the Hercules Powder Company, secretary, were as follows:

PRODUCTION

	Rosin 500-lb. barrels	Turpentine 50-gal. barrels	Pine Oil gallons
Month of August	38,537	5,904	282,242
Total from April 1, '34	202,825	32,623	1,408,757

STOCKS AT PLANT

Total August 31, '34	105,887	19,078	.....
March 31, '34..	89,963	19,253	.....
Change .....+15,924		—175	.....

Note—Rosin production and stocks include all grades of wood rosin.

DEPT. OF LABOR INDICES

	Aug. '34	Aug. '33	July '34
Employment	98.3	89.4	97.3
Payrolls	51.3	36.3	50.3

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New York Philadelphia Chicago Detroit Pittsburgh

Cincinnati East Liverpool Los Angeles San Francisco

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Since 1892

FLUORINE???

Are you in need of a source? Listed below are fluorine compounds that can be supplied on request. Others are being developed by our research staff.

Aluminum Fluoride
Ammonium Acid Fluoride
Ammonium Borofluoride
Ammonium Silico Fluoride
Antimony Trifluoride
Barium Fluoride
Calcium Fluoride
Chromium Fluoride
Hydrofluoric Acid
Hydrofluosilicic Acid
Harshaw Frosting Mixtures (for glass)
Harshaw Laundry Sours
Iron Fluoride
Lead Fluoride
Lithium Fluoride
Magnesium Silico Fluoride
Nickel Fluoride
Potassium Acid Fluoride
Potassium Fluoride
Potassium Borofluoride
Sodium Acid Fluoride
Sodium Borofluoride
Sodium Fluoride
Sodium Silico Fluoride
Zinc Fluoride

If you will inquire, perhaps we could be of assistance to you.

Church & Dwight, Inc.

Established 1846

80 MAIDEN LANE NEW YORK

Bicarbonate of Soda

Sal Soda

Monohydrate of Soda

Standard Quality

loan basis for naval stores from the Commodity Credit Corporation, at Washington, may be successful, which, if carried out, would no doubt stimulate withdrawals of supplies from the markets for the purpose of promoting higher prices. European reports continue to indicate somewhat of an atmosphere of indifference to what is going on in the naval stores industry and trade on this side of the Atlantic, with an emphasizing of the belief that so far as this season is concerned not much higher prices can be had without very heavy withdrawals and refusal to sell.*

Savannah Visitors

Hercules' London naval stores technical service head, C. Turnbull, was a September visitor at Savannah.—Naval Stores Administrator Jay Ward in a visit secured confirmation of the election of the control committee for the naval stores factors and for the naval stores dealers. He meets with these committees shortly. He is optimistic about the working out of the new plans for allotment.

Alpha Turpentine is a new Savannah naval stores company.

* Granting of a higher loan basis on Oct. 8 raises turpentine price 6c.

Chemical Specialties

Super Pyro Plans

Hoping to get the jump on winter, U. S. I. will start early in October a campaign for Super Pyro antifreeze solution. Four insertions are scheduled for *Saturday Evening Post*, 4 for 70 newspapers and 2,000 posters will be shown for 2 months on main highways.

Largest antifreeze campaign yet undertaken by the company, explains Leslie S. Gillette, advertising manager, it will involve an expenditure of several hundred thousands dollars, or 300% more than that of last year. United Advertising Agency is in charge, with Horton M. Heath, account executive.

A $5,000 slogan contest will be emphasized, Mr. Gillette adds. A 1st prize of $1,000 and 477 others will be offered. Starting from 3 to 6 weeks before expected arrival of cold weather, contest is planned to familiarize motorists with the 5 principal features of the product before the thermometer becomes insistent. One feature is "rust protection." When participants call at dealers for entry forms they will receive information on Super Pyro as well.

Introduced last year, he points out, 2,000,000 gals. were sold to about 1,000,000 motorists, on an advertising expenpenditure of less than $100,000. Mr. Gillette expects proportionate increase in business this year. Socony stations in New York and New England and Firestone stations nationally have been added to the 35,000 other dealers handling the product.

Industry Gossip

Cudahy Packing, Chicago, is asking Old Dutch users to indicate whether famous Old Dutch girl in pursuit of dirt trade mark should be retained. In connection with balloting, $1000 and 164 other prizes will be offered for best answers to: "Why I prefer to Use Old Dutch."—Philadelphia exterminators, Vogel-Ritt, Inc., appoint Jerome B. Gray Co. to handle advertising.—National Carbon (Union Carbide) is putting on one of the largest advertising campaigns ever attempted in the anti-freeze field for "Prestone."—Heller Advertising Service, Newark, will handle Chipman Chemical's advertising.—Makers of "Sani-Flush" and Mel'o are installing Packomatic packaging equipment for the latter, according to September issue of *Packomatic* of the J. L. Ferguson Co., Joliet, Ill.—Three-in-One Oil is organizing "Safety Leagues" for children through its dealers.—Cleanser manufacturers are now under a sub-division code of the soap and glycerine industry.

Repackaged

"Getz-M" (rodent poison) package is redesigned by Leonard Arthur Wheeler & Associates.—Talbot's Argentine Ant Poison is now marketed in a new safety package that guards against accidental poisoning of dogs.—"Keyspray"—a liquid insecticide for moth prevention, and made by Keystone Chemical, Chicago, is out in a new can by Giles Can, also of Chicago.—"Whiz Hand Soap" of Davies-Young Soap, Dayton, is now marketed in one pound cans using bright orange color liberally.

New Product

"Lucky Tub"—new porcelain and enamel cleaner by Gleam Products, N. Y. City.

New Companies

Wizard Chemical, 689 Genesee st., Buffalo, by M. Smith, household chemical specialties; Brown Jug Packers at Dover, Del., to handle disinfectants (Delaware Registration Trust Co., Wilmington).

Containers

Metal Package, subsidiary of McKeesport Tin Plate, is acquiring National Can of Boston.—Wilson & Bennett Manufacturing, manufacturer of steel containers, Chicago, is conducting a prize contest on the subject, "Three Reasons Why I Think It Is Advantageous to Buy Oil in 5-Gallon Pails."

New Construction

A. S. Boyle Co., manufacturer of floor waxes, Cincinnati, awards a general contract for the erection of a one-story addition to its plant. New structure will be built of reinforced concrete and will cost about $40,000.

Soap

Robert Manley Watson, 34, former P. & G. sales manager, died Sept. 7 at Miami. With an enviable war record matching his brilliant business career, a complete nervous collapse in '31 forced him to retire.—Lever Brothers, Cambridge, Mass., one of soapdom's "big 3," starts a broadcast program over 40 NBC stations for Lux flakes and Lux toilet soap.—Lever Brothers is starting 2 suits, one against National Milling and Chemical, Philadelphia, and another against Iowa Soap, alleging imitation of "Lifebuoy" and unfair competition. An injunction against Jay Chemical has been made permanent and another court action is pending against J. Eavenson & Sons, Inc., of Camden, N. J.—Its-It Products is a new Elmira, N. Y. soap works, location, 701 W. Gray St.—Japanese soap is said to be arriving in the N. Y. Market for the 1st time.

DEPT. OF LABOR INDICES

	Aug. '34	Aug. '33	July '34
Employment	98.6	96.6	97.7
Payrolls	86.1	75.3	84.3

Gums, Waxes, Shellac

Wax markets continue to be featured by scarcity of stocks of Carnauba with prices still rising. On the other hand, a competitive situation has arisen in Candelilla and the market is reported at 12½c for spot goods and reports from

Important Wax Price Changes

	Sept. 29	Aug. 31
ADVANCED		
Carnauba, No. 1	$0.37	$0.34½
No. 2 N. C.	.28	.27½
No. 3 N. C.	.23	.22
DECLINED		
Candelilla	$0.12½	$0.13¼
GUMS		
ADVANCED		
Dammar Singapore No. 1	$0.16½	$0.15½
No. 2	.10⅜	.09⅜
Manila loba CBB	.08½	.07⅞
DECLINED		
Benzoin Sumatra	$0.18	$0.20
Manila, loba D	.08	.08¼
loba DU	.07⅝	.08

MALLINCKRODT IODINE PRODUCTS

IODIDES, Iodates, Iodine tincture—expert chemists, up-to-the-minute machinery, the finest raw material and infinite care, all go to make every one of the 57 Mallinckrodt Iodine products, masterpieces of chemistry.

Potassium Iodide, for example, is manufactured to meet unusual standards of purity. It is free from foreign odors . . . and extremely low in chlorine and free alkaline content.

Mallinckrodt Iodine products remain stable over a prolonged period and the salts dissolve more readily than ordinary salts of iodine.

CHECK THESE 14 MOST IMPORTANT IODINE PRODUCTS AGAINST YOUR NEEDS

Ammonium Iodide U.S.P. IX
Cadmium Iodide
Calcium Iodide
Iodine Tincture U.S.P.
Iodine U.S.P. Resub. and Gran.
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Secondary Amyl Alcohol
Secondary Amyl Acetate
Secondary Butyl Alcohol
Secondary Butyl Acetate

•

Tertiary Butyl Alcohol

Manufactured by

Shell Chemical Company
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Imports, Gums, Shellac, Camphor and Waxes

	August		July		June	
	Quantity	Value	Quantity	Value	Quantity	Value
Gums, Shellac, etc.—						
Damar, lbs.	676,696	$37,604	1,419,474	$112,610	842,630	$50,386
Kauri, lbs.	91,746	13,690	126,240	13,253	62,698	4,547
Lacs, crude, lbs	871,769	135,097	408,213	59,106	854,340	122,891
Shellac, unbleached orange, lbs.	504,700	117,540	645,496	127,073	1,359,164	244,931
Shellac, garnet and other unbleached, lbs.	64,156	12,001	14,540	3,064	16,400	3,069
Shellac, bleached, lbs.	37,500	10,116	17,212	3,754	52,140	11,739
Sandarac, lbs.	.....	.....	1,457	547	7,225	2,420
Varnish gums, n.s.p.f., lbs.	821,748	48,889	117,325	69,068	709,191	43,300
Camphor, natural, crude, lbs.	206,614	53,538	239,419	60,490	132,805	32,772
Camphor, natural, refined, lbs.	31,174	13,488	122,931	52,333	21,500	10,410
Camphor, synthetic, lbs.	83,353	34,301	83,333	33,272	84,438	33,493
Arabic, lbs.	1,036,364	68,004	788,429	45,163	604,703	35,612
Tragacanth, lbs.	142,434	28,147	199,501	49,800	146,369	36,720
Waxes—						
Beeswax, bleached, lbs.	.....	.....	4,480	1,179	2,260	632
Beeswax, crude, lbs.	304,981	55,225	301,191	53,950	192,922	33,320
Carnauba, lbs.	480,675	111,303	451,610	94,677	434,367	91,622
Vegetable, n.s.p.f., lbs.	57,256	6,335	403,762	27,705	279,472	21,669
Animal, n.s.p.f., lbs.	.....	.....	.....	.....	192	119

primary centers are said to indicate offerings that would make local prices still lower, some say as low as 11c, although this is stoutly denied in other quarters. Japan is firm and higher prices are talked of based on higher asking prices in primary centers. Beeswax, all grades, is another item showing strength. Generally speaking, volume of trading in the wax markets remains at a very slow and halting pace.

GUMS ARE SLOW

Varnish gums moved out in small quantities and total trading volume was distinctly disappointing in local centers. Several minor quotation changes were made during September to bring items more in line with present replacement figures in primary centers.

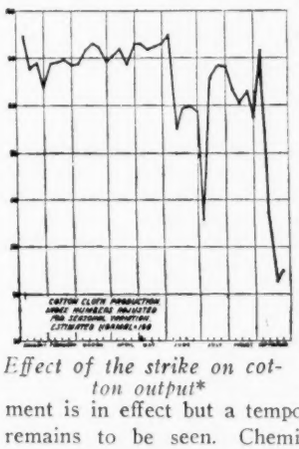
SHELLAC MARKETS QUIET

Shellac markets remain quiet and prices unchanged from last month's figures. London stock, now reported in excess of 305,000 packages, is still main topic of conversation in local shellac circles, and, while there is no indication of any attempt on the part of the English syndicate to unload, size of this surplus is recognized as a threat to future prices.

Compared with August close, Sept. 28 quotation in Calcutta represents a decline. On Aug. 31 pure T. N., c&f N. Y., basis sterling at $4.88, was quoted at 19.65c, while on Sept. 28 cables report 19c. London market saw a net loss in the same period, October delivery, for example, 21.4c against 20.4c.

Textile and Tanning Chemicals

After considerable bloodshed and a perfectly enormous waste of money the textile strike is ended. A detailed examination of the terms of settlement is beyond the scope of this review. Whether or not the basic questions at stake are permanently settled, or whether the present agreement is in effect but a temporary truce remains to be seen. Chemical textile specialty producers and suppliers of raw materials to the textile field welcome the resumption of activity and noticeable pick-up in shipments is reported. The September totals in most items were very poor.



*Effect of the strike on cotton output**

Outstanding developments include sharply higher valonia prices and withdrawal of quebracho quotations; a 1c advance in egg yolk, and a further net loss in zinc dust prices. Reports from the Argentine indicate that factors there are organizing an association and with higher prices one important possibility from the formation of such an organization, local importers and dealers here are unwilling to name future prices at the moment.

* *N. Y. Times*

Important Price Changes

ADVANCED

	Sept. 30	Aug. 31
Egg yolk	$0.45	$0.44
Mangrove bark	32.00	26.00
Valonia beards	48.00	39.50
Cups	32.00	28.00

DECLINED

Casein, 80-100 mesh	$0.11¼	$0.13
20-30 mesh	.10¾	....
Sumac, ground Italian	62.00	69.00
Zinc dust	.059	.0625

TANNING PROSPECTS

More satisfactory rate of activity in the tanning industry is looked for shortly. On Sept. 19 Relief Administrator Harry L. Hopkins, president of the Federal Surplus Relief Corp., confirmed earlier agreement made with the tanners and reaffirmed plan to withhold processing or disposition of cattle hides and sheepksins in the market.

Onyx Mellon Fellowship

Mellon Institute Director Weidlein, announces that Onyx Oil & Chemical, 15 Exchange Place, Jersey City, N. J., has founded an Industrial Fellowship in that institution. This Fellowship, whose incumbent is Dr. Robert N. Wenzel, is concerned with the scientific investigation of problems in textile processing and finishing.

Oils and Fats

Perfunctory trading is again the 2 word report on the oils. Cocoanut oil is higher, while chinawood is weaker. Copra, naturally, is higher. Linseed (reviewed elsewhere) is off from late August levels. Palm shows strength and corn oil gains. Rapeseed is quoted at sharply advanced prices; oleo-stearin is treated to a ½c advance and with fairly good prospects of further upward revisions; Perilla is rather easy. Animal oils are firm and generally higher; fish oils, particularly Menhaden, are nominally around the same price levels as prevailed at the end of August, but unsettled prices are reported in some quarters.

COTTONSEED HIGHER

Trading in cottonseed oil remains spectacular and the past 30 day period witnessed a further gain in prices. A comparison with the close Aug. 31 and the close on Sept. 30 last year indicates quite clearly the strength in this commodity:

	Close Aug. 31	Close Sept. 29	Last Year
Oct.	7.28— .30	8.00— .15	4.50— .75
Nov.	7.32— .42	8.10— .14	4.65— .80
Dec.	7.41— .43	8.08	4.75— .83
Jan.	7.50	8.09— .12	4.82— .90
Feb.	7.50— .60	8.10— .17	4.85—5.00
March	7.61— .62	8.24	5.07

Although there is said to be many on the bearish side of this commodity, general consensus is still decidedly bullish. August consumption of cottonssed oil was 402,000 bbls. It is firmly believed in most quarters that with lard prices in their present position, the outlook for substitution is bright. Many insist that oil consumption will run around 3,600,000-bbl. figure of '26-'27. Such consumption would cut deeply into the carryover. A round of the brokerage houses is convincing evidence that many are becoming "cottonseed oil conscious" for the first time. Most recent reliable estimate of the cotton crop (that made by the *N. Y. Journal of Commerce*) indicates a crop of only 9,421,000 bales, which figure is, of course, greatly below the Bankhead Measure quota.

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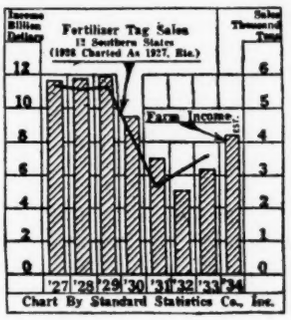
Fertilizers

¶ *August Tag Sales Are Higher —Imports Decline—Sulfate Is Firm—TVA Defines Objects*

Sales of fertilizer tax tags for the month of August in 12 Southern states are 26% larger than the sales for August, '33, and 27% larger than the sales for August, '32. Ordinarily sales for August in the South represent but a small part of the year's total.



Farm income and fertilizer sales.

In the 5 Midwestern states sales for August are 80% larger than the sales in the same 5 States for August, '33, and were very much larger than the small sales recorded in August, '32. Sales for August in the Midwest are of more importance in the year's total than sales in the South for that month.

Seven of 12 Southern states report larger sales than for August, '33. Only 4 of the 12 States report sales totaling more than 2,000 tons. Largest increases over last year were shown in Virginia, North Carolina, Tennessee, and Florida. Several other States show large percentage gains but tonnage represented is comparatively small.

Four of the 5 Midwestern states report larger sales than for last August. Largest gains are shown in Indiana and Missouri. Of the 5 States, Kentucky is the only one that reported smaller sales than for August, '33.

For the 1st 8 months of the calendar year sales of tax tags in 12 Southern states are 16% larger than sales for the 1st 8 months of '33; 37% larger than the sales for the 1st 8 months of '32, but were considerably smaller than the sales for the 1st 8 months of '31.

Imports, Exports

For the 3rd consecutive month imports of fertilizer and fertilizer materials were smaller than the comparable month of 1933. During the early months of this year monthly imports were much larger than the imports for the same months of '33. August imports total 48,442 long tons compared with 102,028 long tons for August, '33, and 57,561 tons for August, '32. Exports of fertilizer and fertilizer materials for August were 39% larger than the exports for August '33, and were twice as large as the exports for August, '32. August was the 8th consecutive month of the present year in which exports have been larger than the exports for the comparable month of '33.

Important Price Changes

ADVANCED

	Sept. 30	Aug. 31
Blood, dried, S. A.....	$3.10	$3.00

DECLINED

Fish scrap, dried.....	$2.50	$2.60
Hoof meal, Chicago....	1.90	2.00
Linseed cake	30.00	33.00
Meal	38.50	40.00
Tankage, Ground, N. Y.	2.90	3.00
Unground	2.50	2.60

DEPT. OF LABOR INDICES

	Aug. '34	Aug. '33	July '34
Employment	75.1*	64.2	71.0a
Payrolls	58.0*	46.4	56.9a
Fert. mat. prices...	64.8	69.0	67.6
Mixed fertilizers....	73.0	64.4	72.8

* Preliminary; a Revised.

Only materials showing larger imports for August, than for August, '33, calcium cyanamid, ammonium phosphate, "other nitrogenous materials," 20% kainite, and fertilizers containing nitrogen, phosphoric acid, and potash. There are large declines in important materials such as ammonium sulfate, sodium nitrate, and 30% manure salts. Excepting high grade hard rock and concentrated chemical fertilizers, shipments of all materials during August were larger than for August, '33. There were large gains in the shipments of ammonium sulfate, land pebble rock, and superphosphate.

Light Purchasing

September trading in fertilizer materials was extremely light, purely of a very routine nature. Quite evident is the fact that the fireworks in the potash field have subsided to a whisper and reported concessions on discounts appear to be a thing of the past. With practically all worthwhile tonnage under contract no sensible reason exists for producers to deviate from published figures. Sulfate of ammonia is in a strong position and this fact is exerting a strengthening influence on nitrate. On the other hand, the organic ammoniates are somewhat less firm than during the previous month, due largely to a decided slump in demand. Firm position of superphosphates continues, and in most quarters the belief of higher prices at the turn of the year still prevails. Ammonium sulfate is another item about which much speculation continues. The extremely low operating level in the steel industry is expected to cause higher prices, unless conditions in the steel centers improve very shortly.

Phosphates, Not Nitrogen

In a radio address Dr. Harcourt A. Morgan, TVA director, announces production of fertilizer phosphates is the major problem to be solved. Said he about Muscle Shoals:

"The nitrate plant's place as a source of nitrogen in time of war is one thing; its use in soil recovery and rehabilitation in time of peace is quite another. Its national defense aspects will be maintained, but its contributions to agriculture must be in researches to cheapen the processing of available phosphorus and the combining of this element with the other plant foods. As a nation, we must be prepared to adjust our agriculture to the needs of succeeding generations, no matter what economic complexities may arise."

New Potash Source?

Announcement is made that Bohn Aluminum & Brass, Detroit, has perfected a process for manufacture of aluminum from Alunite with potash as a by-product. Process is reported being checked by an outside laboratory. A pilot plant to cost $50,000 is expected to be in operation within 60 days at Detroit, and final project will call for an investment of between $10,000,000 and $15,000,000. A separate company, financed by a bond issue, with the entire common stock owned by Bohn Aluminum, is planned.

Armour at Houston

Armour Fertilizer is establishing a Houston, Texas, branch with E. T. MacNamara as division sales manager. According to President Sanford, Houston office will have supervision over business in Texas, Oklahoma and New Mexico.—Molony Fertilizer is chartered at Charleston, S. C.

Good, If True

Dr. Henry G. Knight, Chemistry & Soils, in a National Farm and Home Radio Hour, informs farmers chemists believe they have found cheap method of driving fluorine out of phosphate rock. In the form of calcium fluoride large quantities are responsible for unavailability of such phosphates.

Soviet Fertilizers

Jacksonville waterfront is treated to the sight of the flag of Soviet Russia. Freighter *Voroshilov* brings 2,006 tons of fertilizer material.

Obituary

J. F. Craft, 65 Greer, S. C. fertilizer dealer on Sept. 11.

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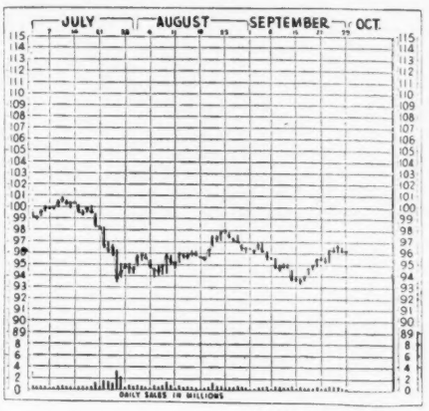
The Financial Markets

Loses Ground

The stock market lacked natural strength to register a second consecutive monthly advance with the result that a $298,616,158 net loss in values is

Daily Record of Stock Market Trend



N. Y. Herald-Tribune

recorded by the N. Y. Stock Exchange. Decline compares with a net gain of $1,866,022 in August and a net loss of $3,687,886,059 in July. In August chemical stock values rose from $3,377,338,976 to $3,527,295,568, a net gain of $49,956,592. In September the chemical list slipped off slightly to $3,521,240,667, a net loss of $6,054,901.

Earnings Statement

Chemical and financial circles, anticipating satisfactory earnings statements from fertilizer companies, are not being disappointed. AAC's $977,119 net profit for fiscal year ending June 30, as compared with a net loss of $508,127 (C.I., Sept. p 267) in the previous corresponding period, is followed by IAC's net profit of $400,386 for year ending June 30, contrasting sharply with a $1,060,096 net loss year earlier. Reports IAC President Watson:

"No dividends were paid during the year." (AAC paid a 50c quarterly dividend Sept. 28). "Bonds to the amount of $184,000 were retired . . . The shorter workday and the higher daily wage required by codes generally have added to the cost of many materials which we use and also to our own cost of manufacturing, but the industry has been benefited by the elimination of many of the unfair trade practices which were previously so harmful."

Net profit of $400,386 after expenses, interest, $435,287 depreciation and depletion on phosphate rock mined and other charges, is equal to $4 a share on 100,000 shares of $100 par .7%, prior preference cumulative stock.*

V.-C.'s report shows a net profit of $498,377 for the year ended June 30 against a loss of $762,828 in the preceding year. Profit for the last year is equal to $9.05 a share on the 54,372 shares of 7% cumulative prior preference stock on which accumulated unpaid dividends at the close of the fiscal year amount to $17.50 a share. This report, it is said, was disappointing to many on the street, who expected larger earnings.

PENN. SALT

Aside from the annual reports of the leading fertilizer producers, reported above, very few earnings statements of importance were released in September. Most interesting was the sharp rise in net profits shown by Penn Salt. Report for fiscal year ended June 30, '34, certified by independent auditors, shows consolidated net income of $757,236, after depreciation, depletion, federal taxes and write-down of $93,478, in book value of trade marks, patents, etc., equivalent to $5.05 a share (par $50) on 150,000 shares of capital stock. This compares with $325,746 or $2.17 a share in preceding year.

Consolidated balance sheet as of June 30, '34, shows total assets of $14,687,949 comparing with $14,341,189 on June 30, '33, and earned surplus of $4,248,836 against $3,946,440. Current assets amounted to $5,190,745 and current liabilities were $686,997 comparing with $4,607,118 and $650,098 respectively, at end of preceding fiscal year. Cash and marketable securities totaled $1,817,274 against $1,066,626.

* Accumulations on the prior preference now total $45.50.

Other statements released of importance included:

Ducktown Chemical and Iron Co. (controlled by Copper Pyrites Corp. through Ducktown Pyrites Corp.)—For 1933: Net loss after expenses, depreciation, interest and other deductions, $236,010, compared with $485,496 loss in 1932.

United Dyewood and subsidiaries—Six months ended June 30: Net profit after depreciation, taxes and other charges, $111,722, equal to $3.50 a share on 32,027 7% preferred shares, excluding treasury stock, compared with $93,585, or $2.65 a share on 35,368 preferred shares, in same period last year.

Leslie-California Salt Co., year ended June 30, net profit $245,504 after taxes and charges, equal to $2.10 a share on 116,520 shares compared with $239,345 or $2.05 a share in the preceding fiscal year.

DUVAL TEXAS SULPHUR †

Duval Texas Sulphur in its report for the year ending Aug. 31 shows a net income of $38,976.92; a gross income, before property retirement and depletion expense of $254,455.75. Details of the income and surplus for the year ended Aug. 31 are given:

Operating Revenue..		$556,710.90
Operating Expenses and Taxes (including estimated Federal income tax)..		313,109.58
Net Revenue from Operations (before property retirement and depletion expenses)		$243,601.32
Other Income:		
Interest	$7,779.10	
Rentals	1,607.50	
Miscellaneous	1,467.83	
Total		10,854.43
Gross Income (before property retirement and depletion expense)..		$254,455.75
Income Charges:		
Property retirement and depletion expense, based on tons of sulphur sold	$215,450.00	
Interest	28.83	
Total		215,478.83
Net Income		$38,976.92
Surplus, Sept. 1, '33		19,109.81
Surplus Credit—Adjustment of sulphur inventory at Sept. 1, '33, to include the property retirement and depletion cost per ton applicable thereto, previously charged to Income		86,621.04
Gross Surplus		$144,707.77
Surplus Charge—Additional franchise and capital stock tax applicable to prior years		3,972.25
Surplus, Aug. 31,'34		$140,735.52

† See p. 346 this issue for details of a new Duval Sulphur plant.

Price Trend of Chemical Company Stocks

	Close Aug. 31	Sept. 7	Sept. 14	Sept. 22	Close Sept. 29	Net change	1934 High	1934 Low	1933 High	1933 Low
Allied Chem.....	130	127½	117	122¼	126	—4	160¾	115⅛	152	70¾
Air Reduction	97	99⅛	96¾	102½	101¼	+4¼	106¼	91¾	112	47½
Anaconda	12¼	11¾	10⅞	11⅝	11⅝	— ⅝	17¾	10	22⅞	5
Col. Carbon	67	65⅛	62	65	67½	+ ½	77¼	58	71½	23⅛
Com. Solvents	21	19¼	17¾	19⅞	20⅜	— ⅝	36¾	15¾	57¾	9
du Pont	90	87⅝	94¼	88¼	90⅞	+ ⅞	103⅞	80	96⅜	32⅛
Mathieson	28⅛	26¼*	24	25¼	26⅜	—1¾	40¾	23½	46⅝	14
Monsanto	53	51	49	52½	53⅞	+ ⅞	55½	39	83‡	25‡
Std. of N. J.....	44¼	44	41⅝	43½	43½	— ¾	50⅛	40⅝	47½	22¾
Texas Gulf S.....	34½	34¼	33½	36	36½	+2	43¼	30	45¼	15¼
U. S. I.	40¼	37	35¼	35¾	36	—4¼	64¾	32	94	13½

* Ex-dividend; ‡ Old stock.

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PLUS CHARGES

Over the Counter Prices

	July 31	Aug. 31		Oct. 3	
Am. Hard Rubber ..	8½	5½	8	5½	8
Canadian Celanese, com. 16	18	16½	18¼	15¼	17¾
Canadian Celanese, pfd. 107	111	107½	110½	107½	110½
Dixon Crucible ..	50	42	47	38	44
Merck, pfd. 124	129	123	127	122	125
Tubize Chat., 7%, cum. pfd. 55	58	54	57	44½	47½
Worcester Salt 45	49½	42½	47½	44	49
Young, J. S., pfd. 99½	..	100	..	100	..
Young, J. S., com. 71	..	72	..	72¼	..

Foreign Markets

	July 31	Aug. 31	Oct. 3
London			
British Celanese..	10s 7½d	10s 9d	12s
Celanese	£3⅝	£4	£4¾
Courtaulds	44s 7½d	46s 4½d	47s 4½d
Distillers	87s	88s 9d	.....
I. C. I.....	35s 1½d	37s	36s 10½d
Unilever, ord.....	19s	22s	23s
Un. Molasses....	17s 3d	19s 6d	21s 7½d
Paris			
Kuhlmann	...	...	...
L'Air Liquide...	700	690	590
Berlin			
I. G. Farben....	147	148	144
Milan			
Snia Viscosa.....	261½	274½	271½
Montecatini	155¼	158	168

Banned

Rayon Industries Corp., Class "A" common stock is among the list of securities "banned" by the S.E.C.

Dividend Increases

Among those announcing dividend increases Continental Can with a 50% stock dividend; Air Reduction with a $1.50 extra besides the 75c regular.

British Monsanto Financing

British bankers, who recently bought 400,000 pounds of an authorized issue of 500,000 pounds of non-voting cumulative stock of Monsanto Chemicals, Ltd., receive applications for more than 2,000,000 pounds, reports Edgar M. Queeny, president, Monsanto Chemical, of which the British company is a subsidiary. Offering was made to the public at 20 shillings, 6 pence per share, or 6 pence above par.

Registrations

Among issues registered with Federal Trade Commission are following:

Sigua Manganese Corp. (2-1117, Form A-1), New York, N. Y., a Delaware corporation organized May 31, 1934, to develop and mine manganese claims and to conduct a general manganese mining and sales business in Cuba. A $250,000 issue of common stock is proposed, 25,000 $10-par shares to be offered at par. The company's officers are Luis Batlle, Santiago, Cuba, president; W. Albanos, Holguin, Cuba, vice-president, and E. Mora, New York City, secretary-treasurer.

General Potash Co. (2-1112, Form A-1), Denver, Colorado, a Colorado corporation engaged in potash mining, proposing to issue $600,000 in no par common stock having a stated value of $10 per share. A total of 40,000 shares are to be offered at $15 per share. Officers of the company are C. L. Modesitt, Denver, Colo., president; W. A. Snyder, Carlsbad, New Mex., vice-president; Russell S. Harris, Omaha, Nebr., treasurer, and A. X. Erickson, Denver, Colo., secretary.

Ask Payment

Fifteen V.-C. prior preference stockholders are sueing to compel dividend payments. Court is asked to advise directors whether they can vote for and pay a dividend on the 7% preference stock without assembling personal liability for such action, under provisions of the Securities Exchange Act.

Plaintiffs contend that "refusal of the directors to declare a dividend on prior preference stock was caused by divergent interests of different classes of stockholders and antagonistic feelings aroused by the further fact that some of the directors feared that if they voted to declare such dividend, they would be held personally liable for so doing under the provisions of the Securities Act."

Miscellany

National Oxygen, Chicago, calls for payment entire issue of its 8% bonds, due May 4, '35, at 100 and interest, through Central Republic Trust, Chicago.—Stockholders of Wood Chemical Products Sept. 11 approve Southern Pine Chemical, which incorporates Wood Chemical, Georgia Pine Turpentine and Liberty Pine Products.

Du Pont Registers

Du Pont in a letter to stockholders reports temporary registration of its common and debentures with the S. E. C. (Stock Exchange Commission), stating: "Matter of permanent registration will not be decided until after the issuance of regulations applicable thereto by the commission."

Wall St. Gossip

Reports current in Wall St. circles are that AAC may bid for a further block of its capital stock, and that the V.-C. will make a proposition to its prior preferred shareholders to retire the remaining small total of outstanding shares, according to *Wall St. Journal's* Broad St. Gossip column.

Dividends and Dates

Name	Div.	Stock Record	Payable
Abbott Labs.....	50c	Sept. 14	Oct. 1
Abbott Labs. ext.	10c	Sept. 14	Oct. 1
Air Reduction...	75c	Sept. 29	Oct. 15
Air Reduction, ext.	$1.50	Sept. 29	Oct. 15
Allied Chemical.	$1.50	Oct. 11	Nov. 1
Allied Chemical, pf.	$1.75	Sept.11	Oct. 1
Am. Agr. Chem.	50c	Sept. 20	Sept. 29
Canadian Industries A	$1.00	Sept. 29	Oct. 31
Canadian Industries B	$1.00	Sept. 29	Oct. 31
Celanese Corp. 7% cum. pr. pf.	$1.75	Sept. 14	Oct. 1
Chickasha Cotton Oil, spec.....	50c	Sept. 10	Oct. 1
Clorox Chemical.	50c	Sept. 20	Oct. 1
Colgate-Palmolive-Peet, pf.	$1.50	Sept. 10	Oct. 1
Consol. Chemical, Cl. A	37½c	Oct. 15	Nov. 1
Devoe & Raynolds, A	25c	Sept. 20	Oct. 1
Devoe & Raynolds, A, ext..	25c	Sept. 20	Oct. 1
Devoe & Raynolds, B	25c	Sept. 20	Oct. 1
Devoe & Raynolds, B, ext..	25c	Sept. 20	Oct. 1
Devoe & Raynolds, 1st pf...	$1.75	Sept. 20	Oct. 1
Devoe & Raynolds, 2nd pf..	$1.75	Sept. 20	Oct. 1
du Pont, deb....	$1.50	Oct. 10	Oct. 25
Eastman Kodak.	$1.00	Sept. 5	Oct. 1
Eastman Kodak, pf.	$1.50	Sept. 5	Oct. 1
General Printing Ink	15c	Sept. 17	Oct. 1
Glidden Co.	25c	Sept. 14	Oct. 1
Glidden Co., pr. pf.	$1.75	Sept. 14	Oct. 1
Glidden Co., ext.	15c	Sept. 14	Oct. 1
Hercules Powder, pf.	$1.75	Nov. 2	Nov. 15
Imp'l Chem. Indus.	2½%	less tax.	
Industrial Rayon	42c	Sept. 17	Oct. 1
Int'l Nickel.....	15c	Aug. 30	Sept. 29
Int'l Nickel, pf..	$1.75	Oct. 2	Nov. 1
Int'l Printing Ink, spec.....	25c	Oct. 15	Nov. 1
Int'l Printing Ink, pf.....	$1.50	Oct. 15	Nov. 1
Int'l Salt	37½c	Sept. 15	Oct. 1
Koppers Gas & Coke, pf.	$1.50	Sept. 12	Oct. 1
Liquid Carbonic.	25c	Oct. 17	Nov. 1
MacAndrews & Forbes	50c	Sept. 29	Oct. 15
MacAndrews & Forbes, pf.....	$1.50	Sept. 29	Oct. 15
Mathieson Alkali	37½c	Sept. 29	Oct. 16
Mathieson Alkali, pf.	$1.75	Sept. 10	Oct. 1
Merck Corp., pf.	$2.00	Sept. 17	Oct. 1
Monroe Chemical, pf.	87½c	Sept. 15	Oct. 1
National Lead Co.	$1.25	Sept. 14	Sept. 29
National Lead Co., pf. B....	$1.50	Oct. 19	Nov. 1
N. J. Zinc Co...	50c	Oct. 20	Nov. 10
Penn. Salt Mfg.	75c	Sept. 29	Oct. 15
Pittsburgh Plate Glass	35c	Sept. 10	Oct. 1
Pratt & Lambert	25c	Sept. 15	Oct. 1
Procter & Gamble, 8% pf....	$2.00	Sept. 25	Oct. 15
Spencer Kellogg.	40c	Sept. 15	Oct. 1
Union Carbide..	35c	Sept. 4	Oct. 1
United Carbon..	60c	Sept. 15	Oct. 1
United Dyewood, pf.	$1.75	Sept. 14	Oct. 1
Vulcan Detinning, pf.	$1.75	Oct. 10	Oct. 20
Westvaco Chlorine	$1.75	Sept. 15	Oct. 1
Will & Baumer Candle, pf.....	$2.00	Sept. 20	Oct. 1

Latest Earnings Reports Summarized

Company:	Annual dividends	Net income 1934	Net income 1933	Common share earnings 1934	Common share earnings 1933	Surplus after dividends 1934	Surplus after dividends 1933
Chickasha Cotton Oil Co.:							
Year, June 30.....	$z.50	$837,317	$332,992	$3.28	$1.30	$391,067	$205,492
Leslie-California Salt Co.:							
Year, June 30.....	1.40	245,504	239,345	2.10	2.05	*.....	*.....
United Dyewood Corp.:							
Six months, June 30.....	f...	111,722	93,585	p3.54	p2.64	.....	.....
United Chemicals, Inc.:							
June 30 quarter	f...	†23,835	.....	....	....	.....	.....
Six months, June 30.....	f...	†47,937	†79,220	....	....	.....	.....
U. S. Smelting Ref. & Mng. Co.:							
Eight months, August 31..	v9.00	4,148,484	2,504,039	5.78	2.67	.....	.....
Virginia-Carolina Chemical:							
Year, June 30.....	f...	492,377	†762,828	q.52	....	.....	.....

z Last dividend declared; period not announced by company; * Not available; f No common dividend; † Net loss; v Declared during the year 1934; q On 6% preferred stock.

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The Industry's Securities

1934 Sept. Last	1934 Sept. High	1934 Sept. Low	1933 High	1933 Low	1932 High	1932 Low	Sales 1934	Sales Sept.	Stocks	Par $	Shares Listed	An. Rate	Earnings $-per share-$ 1933	Earnings $-per share-$ 1932
							Number of Shares							
NEW YORK STOCK EXCHANGE														
101½	106¼	91¾	112	47½	63½	30⅞	150,200	14,400	Air Reduction	No	841,288	$3.00*	3.79	2.73
126	160¾	115⅛	152	70¾	88¼	42½	244,300	18,100	Allied Chem. & Dye	No	2,214,099	6.00	5.50	3.62
126	130	122⅜	125	115	120†	96½	8,000	500	7% cum. pfd.	100	345,540	7.00	42.24	29.12
38¼	41⅜	25¼	35	7¼	15½	3½	182,300	7,000	Amer. Agric. Chem.	100	315,701	2.00	p4.19	—p1.61
27½	62½	20¾	89⅞	13	27	11	498,400	16,200	Amer. Com. Alcohol	20	260,716	None	4.56	3.01
34	36	26¼	29¼	9¾	15½	7	90,500	6,000	Archer-Dan-Midland	No	541,546	1.00	p3.82	p1.79
44½	55½	35¼	39⅛	9	25½	7	73,400	5,600	Atlas Powder Co.	No	234,235	2.00	.74	—2.06
102	103½	83	83⅛	60	79½	45½	5,830	170	6% cum. pfd.	100	88,781	6.00	8.38	.47
25	44⅞	17⅛	58⅞	4½	12⅝	1¼	993,700	89,400	Celanese Corp. Amer.	No	987,800	None	3.32	— .95
14⅝	18⅞	9⅜	22⅜	7	31½	10¼	683,100	21,000	Colgate-Palm.-Peet	No	1,985,812	.50	— .57	— .74
91	95	68½	88	49	95	65	11,800	700	6% pfd.	100	254,500	6.00	1.51	.21
67½	77¼	58	71½	23⅛	41⅞	13½	282,300	10,700	Columbian Carbon	No	538,154	3.40	2.17	1.83
20⅜	36¾	15¾	57¼	9	13¾	3½	2,379,700	76,100	Commer. Solvents	No	2,635,371	.60	.88	.51
63¼	84½	55½	90⅝	45⅜	55⅜	24¾	312,600	18,900	Corn Products	25	2,530,000	3.00	3.87	2.77
146	148½	135	145¾	117½	140	99½	7,100	500	7% cum. pfd.	100	243,739	7.00	46.02	35.05
40	55⅛	29	33⅞	10	16¾	7	70,200	3,100	Devoe & Rayn. A	No	95,000	h1.00	3.82	—r1.00
90⅞	103⅞	80	95⅞	32⅛	59¾	22	1,355,700	87,700	DuPont de Nemours	20	10,871,997	2.60	2.93	1.81
124¼	125	115	117	97½	105⅞	80¾	15,000	2,100	6% cum. deb.	100	1,092,699	6.00	35.58	24.00
99¾	101⅝	79	89¾	46	87¾	35¼	182,000	10,900	Eastman Kodak	No	2,250,921	4.00	4.76	2.52
141½	147	120	130	110	125	99	1,930	130	6% cum. pfd.	100	61,657	6.00	180.34	98.27
23½	50⅜	21½	49⅜	16⅛	28⅝	10	274,200	20,300	Freeport Texas	10	784,664	2.00	3.01	2.75
114	160⅛	113½	160⅛	97	...	...	2,700	500	6% conv. pfd.	100	25,000	6.00	156.73	...
24	28⅜	15⅝	20	3¾	10⅜	3⅛	718,500	12,100	Glidden Co.	No	603,304	1.00	1.54	—s.06
102	104	83	91½	48	76	35	12,215	830	Glidden, 6% pfd.	100	63,044	7.00	22.60	7.85
79¾	96⅞	74	85⅞	65	...	...	41,000	3,200	Hazel Atlas	25	434,409	5.00	6.22	4.68
69	81⅝	59	68⅝	15	29½	13⅞	82,900	11,100	Hercules Powder	No	582,679	3.00	2.79	.24
125	125	111	110⅛	85	95	70½	3,680	80	7% cum. pfd.	100	105,765	7.00	22.38	8.39
25¾	30½	19⅜	85	24	40	7⅛	587,500	16,100	Industrial Rayon	No	600,000	1.68	3.01	.55
3⅞	6⅛	2	5⅞	⅞	3½	¼	235,800	13,200	Intern. Agricul.	No	436,049	None	p—.69	p—4.04
26½	37¼	15	23½	5	15	3¾	30,900	2,900	7% cum. pr. pfd.	100	100,000	None	p—4.00	p—10.60
25⅜	29¼	21	23¼	6¾	12½	3½	2,746,600	141,100	Intern. Nickel	No	14,584,025	.35	.53	— .14
31	32	21	27¾	13¾	23½	9¾	43,600	900	Intern. Salt	No	240,000	1.50	2.04	2.14
25½	27¼	15¾	22	7½	11	8	52,800	1,900	Kellogg (Spencer)	No	500,000	1.60	.98	—v.26
28½	43⅞	25¼	37⅜	4⅜	9⅜	3¼	747,300	20,600	Libbey Owens Ford	No	2,559,042	1.20	1.64	— .13
21½	35⅜	16⅛	50	10¼	22	9	228,300	4,800	Liquid Carbonic	No	342,406	1.00	v1.05	—u1.29
26⅜	40¾	23½	46⅝	14	20⅞	9	428,200	17,400	Mathieson Alkali	No	650,436	1.50	1.70	.86
53⅞	55½	39	83	25	30¾	13⅜	174,500	12,000	Monsanto Chem.	10	864,000	1.00	2.57	1.18
149¼	163	135	140	43¼	92	45	29,800	1,000	National Lead	100	309,831	5.00	6.98	3.15
141	145	122	128¼	101	125	87	4,500	300	7% cum. "A" pfd.	100	243,676	7.00	18.35	13.55
111	116	100½	109⅛	75	105	61	1,970	260	6% cum. "B" pfd.	100	103,277	6.00	30.45	15.45
6¼	13	5½	11¾	1⅜	3¾	1½	129,100	2,500	Newport Industries	1	519,347	None	.05	— .68
66	94	60	96¾	31½	42¼	12	120,400	9,400	Owens-Illinois Glass	25	1,200,000	3.00	4.86	1.62
36½	41¼	33⅛	47½	19⅝	42¾	19⅞	259,100	21,400	Procter & Gamble	No	6,410,000	1.50	1.52	q1.20
115¾	116	102½	110¾	97	103½	81	5,595	450	5% pfd. (ser. 2-1-29)	100	171,569	5.00	61.95	52.16
4⅜	6¾	3⅛	7¼	1⅜	4⅜	1	90,600	2,900	Tenn. Corp.	5	857,896	None	— .11	— .89
36½	43¼	30	45¼	15¼	26¾	12	567,700	47,700	Texas Gulf Sulphur	No	2,540,000	2.00	2.93	2.33
43½	50⅞	35⅞	51⅞	19¾	36⅜	15⅛	888,700	60,200	Union Carbide & Carbon	No	9,000,743	1.40	1.59	.98
43	46½	35	37¾	10¼	18	6⅜	217,000	12,800	United Carbon	No	370,127	2.40	1.39	— .05
36	64¾	32	94	13½	36¼	13¼	300,200	19,600	U. S. Indus. Alco.	No	391,033	None	3.56	.47
17	31¾	14	36¼	7⅝	23¾	5¼	504,600	13,200	Vanadium Corp.-Amer.	No	366,637	None	—2.40	—4.36
3⅝	5⅜	1⅞	7⅜	⅝	2⅜	½	223,600	7,400	Virginia-Caro. Chem.	No	486,000	None	p—2.46	—5.06
18½	26	10	26½	3⅜	11¼	3⅜	79,500	7,700	6% cum. part. pfd.	100	213,392	None	p.52	—5.54
79	84	59¾	63½	35⅜	69¾	20	5,060	200	7% cum. prior pfd.	100	60,000	None	p9.06	—12.71
20	27¼	14⅞	20½	5	12⅝	3	126,550	2,700	Westvaco Chlorine	No	284,962	.40	1.08	.79
NEW YORK CURB EXCHANGE														
17⅛	22½	14¾	16½	3¼	8½	1⅝	88,900	23,500	Amer. Cyanamid "B"	No	2,404,194	m.25	.99	.14
3	4⅛	2½	4½	1	2⅛	¾	27,600	400	British Celanese Am. R.C.R.	243	.....	None	...	...
84	104¼	81	110	27	55	8	8,375	275	Celanese, 7% cum. 1st pfd.	100	144,379	7.00	32.24	.60
88	98½	83	90	51	64¼	17	3,475	.....	7% cum. prior pfd.	100	113,668	7.00	47.98	7.77
8	19	7	26⅞	2	5⅜	1½	19,200	400	Celluloid Corp.	15	194,952	None	—1.00	—3.79
12⅛	14⅜	10½	11⅝	4⅛	6⅞	4½	17,600	500	Courtaulds' Ltd.	1£	24,000,000	4½%	...	...
73¼	79½	67½	78	30	39	21½	51,800	6,200	Dow Chemical	No	945,000	2.00	†3.60	†1.33
6½	10¼	4	8	½	1½	¼	51,000	900	Duval Texas Sulphur	No	500,000	None	z.17	z.30
33	37	19	19	8	...	...	14,300	1,400	Heyden Chem. Corp.	10	147,600	1.00	2.68	1.23
44	57½	39	39⅞	13	19½	12⅛	6,460	2,060	Pittsburgh Plate Glass	25	2,141,305	1.40	1.87	— .03
68	73⅛	47¼	47	12⅞	35	17½	13,425	5,175	Sherwin Williams	25	635,583	2.00	y3.54	— .44
108¼	109¾	100	99	80	100⅛	75	1,860	410	6% pfd. AA. cum.	100	155,521	6.00	y20.78	4.52
CLEVELAND STOCK EXCHANGE														
73	79½	67½	78	30	40	21½	8,951	310	Dow Chemical	No	945,000	2.00	†3.60	†1.33
PHILADELPHIA STOCK EXCHANGE														
63	63	50¼	57	25¼	40	19⅞	2,400	125	Pennsylvania Salt	50	150,000	3.00	2.17	2.42

1934 Sept. Last	1934 Sept. High	1934 Sept. Low	1933 High	1933 Low	1932 High	1932 Low	Sales 1934	Sales Sept.	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE													
102¼	103¼	93½	95	70½	80	62	1,231,000	105,000	Amer. Cyan. deb. 5s	1942	5	A. O.	4,411,000
96¾	99	83⅞	89	64	80	54¼	3,681,000	126,000	Amer. I. G. Chem. Conv. 5½'s	1949	5½	M. N.	29,929,000
10⅝	17¾	5	14⅛	2⅛	18	1	2,718,000	163,000	Anglo Chilean s. f. deb. 7's	1945	7	M. N.	12,700,000
70	88	61½	74⅞	37	60	34½	399,000	14,000	By-Products Coke Corp. 1st 5½'s "A"	1945	5½	M. N.	4,932,000
78	84½	62	65	38½	54⅞	32	212,000	8,000	Int. Agric. Corp. 1st. Coll. tr. stpd. to 1942	1942	5	M. N.	5,994,100
13¾	19½	5⅛	14⅞	2½	15¾	¼	10,815,000	1,261,000	Lautaro Nitrate conv. b's	1954	6	J. J.	31,357,000
92	98½	90	99⅛	87	97¾	67	542,000	62,000	Montecatini Min & Agric. det. 7's with war.	1937	7	J. J.	7,075,045
44	74½	44	62	33¾	59	17	414,000	4,000	Ruhr Chem. 6's	1948	6	A. O.	3,156,000
84¼	88¼	65½	76	50	66	39	203,000	13,000	Tenn. Corp. deb. 6's "B"	1944	6	M. S.	3,007,900
83½	89½	62	81	34¾	75	30	1,434,000	75,000	Vanadium Corp. conv. 5's	1941	5	A. O.	4,261,000
NEW YORK CURB EXCHANGE													
102½	104¼	101⅜	103¼	101	103⅛	99	86,000	10,000	Westvaco Chlorine Prod. 5½'s	1937	5½	M. S.	1,393,000

* Plus 1.50 extra; † Years ended 5-31-33-& 34; h Plus 25c ended 5-31-32-& 33; j Plus 75c ended 5-31-32-& 33; k Plus 75c ended 5-31-32-& 33; m Last paid, no regular rate; p Years ended 6-30-33 and 6-30-34; r Year ended 11-30-32; s Years ended 10-31-32 & 33; u Year ended 9-30-32; v Years ended 9-2-32 & 33; x Years ended 5-31-32 & 33; y Year ended 8-31-33; z Year ended 8-13-32.

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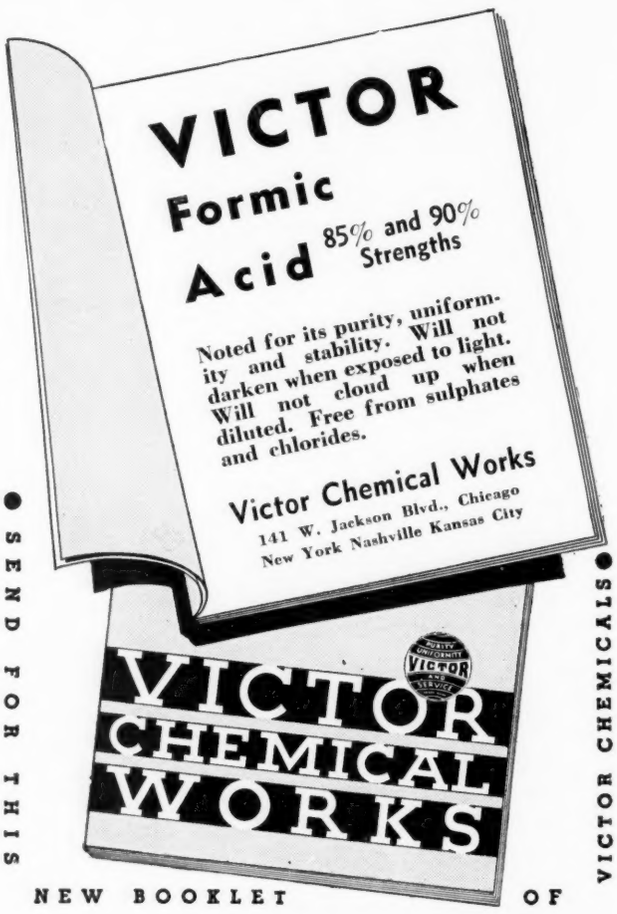
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25% - 30%
K_2O

MURIATE of POTASH
60/62% K_2O

Mine and Refinery
Carlsbad, New Mexico

UNITED STATES POTASH CO.

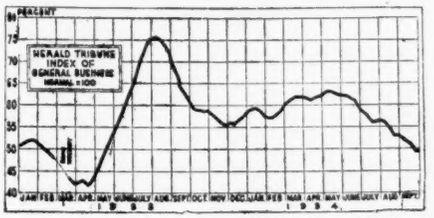
342 Madison Ave., New York

The Trend of Prices

We Start Upward

Industry again appears to be making strides forward. Fall seasonal pick-up is finally making a belated appearance. As in August, business still shows a strange contrast, retail trade is brisk and in good volume, while so-called heavy industries continue to operate at extremely low levels. Former is the most encouraging angle of a rather disconcerting picture. When will this cleaning out of retail shelves reach back to manufacturing lines? Unquestionably the textile strike has been a most important factor in the delay in business getting along the proper paths of expansion. In addition, general feeling of uncertainty among business leaders as to Administration's policies on such questions as labor, tariff, inflation and balancing of the budget, has been growing. In part, at least, the President's recent radio address has helped in dispelling some of this doubt.

Trend of Business Activity



N. Y. Herald-Tribune

HEAVY INDUSTRIES SLOW

In the heavy industries steel operations expanded slightly in the past 4 weeks, but are still extremely low. Automobile production and sales have been maintained in an encouraging manner. Modest expansion is noted in the glass field. While the first response of the country to the Government's plan of remodeling has been satisfactory, it appears that the direct benefits to the paint and allied trades will not come at least until after the turn of the year. Tanners are in a more optimistic mood and feel a little more certain about the plans of the Government on the surplus hides question.

Carloadings and electrical consumption figures generally are running under corresponding periods of last year although the difference is but very slight. The *N. Y. Times* Index of Business Activity at last is showing definite signs of reversing the downward trend of the summer months.

Commodity prices, generally, made gains, although some recession was noted in the last week of the month. On Sept. 29 the Dept. of Labor price index of commodity prices was reported at 77.2% of the 1926 level. On Sept. 30, '33, it stood at 71.1% of the '26 level. Before September, highest general average of '34 was 76.9, in the week of Aug. 25, and the lowest was 71, in the week of Jan. 6. Very spectacular has been the rise in cottonseed oil. Oils generally are higher.

Chemical industry reports tonnage gains in September, but the total is below earlier expectations. This is quite understandable, considering the importance of the textile field in the consumption of chemicals. Ending of the strike brought about a cheering renewal of shipping orders from textile and dyeing centers. October is usually one of the two best months of the year for the chemical industry. With a backlog of orders from the textile field volume is expected to prove quite satisfactory.

Interest is rapidly centering on the contract season. A survey of a large number of both buyers and sellers conducted during the first few days of October in widely diversified lines would seem to indicate that prices are more than likely to remain firm, and in many cases probably will be higher.

Monthly Statistics of Business

	August 1934	August 1933	July 1934	July 1933	June 1934	June 1933
Auto production	244,713	232,855	266,575	229,357	308,051	249,727
Bldg. contracts*‡	$120,269	$105,989	$119,698	$82,554	$127,131	$103,255
Failures, Dun & Bradstreet	929	1,472	912	1,421	1,033	1,648
Merchandise imports‡	$119,515	$154,918	$127,342	$142,980	$136,082	$122,197
Merchandise exports‡	$171,965	$131,473	$166,787	$144,109	$170,574	$119,790
Newsprint production						
Canada, tons	216,164	194,262	208,238	180,387	229,657	171,419
U. S., tons	80,903	84,521	76,184	79,482	83,504	84,384
Newfoundland, tons	.....	.....	27,298	21,178	28,571	20,672
Total, tons	.....	.....	313,767	282,336	343,525	277,871
Newsprint shipments						
Canada, tons	.....	.....	199,926	181,658	225,449	171,678
U. S., tons	.....	.....	70,133	82,068	79,721	87,359
Total (U. S. & Can.)	.....	.....	270,059	263,726	305,170	259,037
Plate glass prod., sq. ft.	7,449,906	11,326,618	7,241,887	.....	6,520,081	9,499,260
Shoe production, pairs	.....	.....	27,981,691	33,749,134	27,783,201	34,861,123
Steel ingots	1,355,043	2,801,033	1,472,584	3,168,354	3,015,972	2,564,420
Steel activity, % of capacity	.....	48.79	26.75	58.30	52.18	45.37
U. S. consumption crude rubber, tons	.....	.....	32,647	49,614	40,242	51,329
Tire shipments	.....	.....	.....	.....	5,228,251	6,305,454
Tire production	.....	.....	.....	.....	4,342,170	6,099,924
Tire inventory	.....	.....	.....	.....	10,219,360	6,614,940
Factory payroll totals†	62.2	56.8	60.4	50.8	64.8	47.2
Factory employment†	79.4	63.4	78.6	71.5	81.0	67.4
Dept. of Labor Chem. price index†	75.7	73.1	75.4	.....	78.6	81.5
Dept. of Labor Chem. employment†	110.9	96.8	112.3	87.9	111.7	80.5
Dept. of Labor Chem. payrolls†	96.5	81.0	96.6	74.4	96.1	68.2
Chemicals & Related Products						
Imports‡	.....	.....	.....	.....	$4,418	.....
Exports‡	$7,722	.....	$7,297	.....	$8,189	.....
Stocks, mfd. goods†	.....	.....	.....	.....	110	107
Stocks of raw materials†	.....	.....	.....	.....	88	87
Electrical consumption by chemicals and allied products†	.....	.....	.....	.....	161.0	135.7

* 37 states, F. W. Dodge Corp.; ‡ 000 omitted; † Dept. of Labor, 3-year average, 1923-1925 = 100.0.

Tung Oil Statistics

Stocks of oil on hand at Hankow the end of July totaled 2,300 short tons, a decrease of 600 short tons for the preceding month and a reduction of 676 short tons for July, '33. Following statistics show the exports of tung oil from Hankow to U. S. for July, '33 and '34, and for June, '34:

1934	Total exports lbs.	To U. S. lbs.	Tons *
July	8,480,000	6,910,000	2300
June	13,542,000	11,464,000	2900
Jan.-July	59,726,000	46,393,000	....
1933			
July	17,982,000	15,656,000	2970
Jan.-July	95,018,000	75,886,000	....

* Hankow stocks short tons.

Weekly Business Statistics

Week Ending	Carloadings 1934	Carloadings 1933	Carloadings % Inc.	Electrical Output* 1934*	Electrical Output* 1933*	Electrical Output* % Inc.	Jour. of Com. Price Index	National Fertilizer Association Indices: Metals	Fats & Oils	Chem. & Drugs	Mixed Fert.	Fert. Mat.	All Groups	Labor Dept. Chem. & Drug Price Index	% Steel Activity	Fisher's Index Purch. Power	N. Y. Times Indexes Bus. Act.
Sept. 1	645,780	673,778	—4.2	1,626,881	1,637,317	—0.6	79.8	81.9	60.2	93.4	76.3	64.8	75.9	76.3	18.4	124.7	75.1
Sept. 8	562,730	577,933	—2.6	1,564,867	1,582,742	—1.1	79.4	81.9	59.4	93.4	76.3	64.6	76.0	76.3	20.9	125.2	74.4
Sept. 15	645,986	660,086	—2.1	1,633,683	1,663,212	—1.8	77.7	81.8	58.1	93.4	76.4	6.49	76.4	76.5	22.3	125.2	71.8
Sept. 22	643,120	659,865	—2.5	1,630,947	1,638,757	—0.5	77.8	81.7	59.7	93.4	76.4	64.9	76.6	76.8	24.2	124.7	72.3
Sept. 29	644,647	669,186	—3.7				77.3	81.6	60.1	93.4	76.4	65.0	76.4	77.0	23.2	124.8	73.7

*kw. 000 omitted.

Prices Current

Heavy Chemicals, Coal-tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Import chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1933 Average $1.56 - Jan. 1934 $1.37 - Sept. 1934 $1.25

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Acetaldehyde, drs 1c-1 wks..lb.	...	.16	.16	.21	.18½ .21
drums, c-l, wks.....lb.	...	.14	.14	.16½	... ...
Acetaldol, 95%, 50 gal dr. wks	.21	.25	.21	.31	.27 .31
Acetamide .....lb.	.38	.43	.40	1.35	.95 1.35
Acetanilid, tech, 150 lb bbl..lb.	...	.26	...	.26	... .26
Acetic Anhydride, 92-95%, 100 lb cbys.....lb.	.21	.25	.21	.25	.21 .25
Acetin, tech drums.....lb.	.30	.32	.30	.32	.30 .32
Acetone, tanks .....lb.	.11	.12	.10	.12	.08 .10
Acetone Oil, bbls NY....gal.	1.15	.25	1.15	.25	1.15 1.25
Acetyl Chloride, 100 lb cby..lb.	.55	.68	.55	.68	.55 .68
Acetylene Tetrachloride (see tetrachlorethane)					
Acids					
Acid Abietic	.06¾	.07	.06	.07	.06 .12
Acetic, 28% 400 lb. bbls c-l wks .....100 lb.	...	2.53	2.53	2.91	2.65 2.91
Glacial, bbl c-l wk..100 lb.	...	8.69	8.69	10.02	9.14 10.02
Adipic	.72	.72	.72	.72	.72 .72
Anthranilic, refd, bbls.....lb.	.85	.95	.85	.95	.85 .95
Technical, bbls.....lb.	.65	.70	.65	.70	.65 .70
Battery, cbys .....100 lb.	1.60	2.25	1.60	2.25	1.60 2.25
Benzoic, tech, 100 lb bbls.lb.	.40	.45	.40	.45	.35 .45
Boric, powd, 250 lb bbls...lb.	.0425	.05	.0425	.05	.0425 .05
Broenner's, bbls.....lb.	1.20	1.25	1.20	1.25	1.20 1.25
Butyric, 100½ basis cbys..lb.	.80	.85	.80	.85	.80 .85
Camphoric .....lb.	...	5.25	...	5.25	... 5.25
Chlorosulfonic, 1500 lb drums wks. .....lb.	.04½	.05½	.04½	.05½	.04½ .05½
Chromic, 99¾%, drs....lb.	.13½	.15½	.13½	.15½	.11½ .14¼
Chromotropic, 300 lb bbls.lb.	1.00	1.06	1.00	1.06	1.00 1.06
Citric, USP, crystals, 230 lb. bbls. .....lb.	.28	.29	.28	.30	.29 .30
Cleve's, 250 lb bbls.....lb.	.54	.54	.52	.54	.52 .54
Cresylic, 95%, dark drs N Y .....gal.	.54	.56	.50	.56	.38 .50
97-99%, pale drs NY..gal.	.59	.61	.55	.60	.40 .55
Formic, tech 90%, 140 lb. cby .....lb.	.11	.13	.11	.13	.10½ .13
Furoic, tech, 100 lb drums.lb.	...	.35	...	.35	... .35
Gallic, tech, bbls.....lb.	.60	.70	.60	.70	.60 .70
USP, bbls.....lb.	...	.77	.74	.77	... .74
Gamma, 225 lb bbls wks..lb.	.77	.79	.77	.79	.75 .79
H, 225 lb bbls wks.....lb.	.65	.70	.65	.70	.60 .70
Hydriodic, USP, 10% soln cby .....lb.	.50	.51	.50	.51	.50 .51
Hydrobromic, 48%, coml, 155 lb cbys wks.....lb.	.45	.48	.45	.48	.45 .48
Hydrochloric, CP, see Acid Muriatic					
Hydrocyanic, cyl. wks....lb.	.80	.90	.80	.90	.80 .90
Hydrofluoric, 30%, 400 lb bbls wks.....lb.	...	.07	...	.07	.06 .07
Hydroflucsilicic, 35%, 400 lb. bbls wks.....lb.	.11	.12	.11	.12	.11 .12
Hypophosphorous, 30%, USP, demijohns .....lb.	.75	.80	.75	.80	.75 .80
Lactic, 22%, dark, 500 lb. bbls. .....lb.	.04	.04½	.04	.04½	.04 .04½
44%, light, 500 lb bbls..lb.	.11½	.12	.11½	.12	.11½ .12
Laurent's, 250 lb bbls.....lb.	.36	.37	.36	.37	.36 .37
Linoleic .....lb.	.16	.16	.16	.16	.16 .16
Maleic, cry. kegs.....lb.	...	.35	...	.35	... ...
Malic, powd, kegs.....lb.	.45	.60	.45	.60	.45 .60
Metanilic, 250 lb bbls....lb.	.60	.65	.60	.65	.60 .65
Mixed Sulfuric—Nitric..... tanks wks.....N unit	.06½	.07¼	.06½	.07¼	.06½ .07¼
tanks wks.....S unit	.008	.01	.008	.01	.008 .01
Monochloroacetic, tech bbl.lb.	.16	.18	.16	.18	.16 .18
Monosulfonic, bbls.....lb.	1.50	1.60	1.50	1.60	1.50 1.60
Muriatic, 18 deg, 120 lb cbys c-l wks.....100 lb.	...	1.35	...	1.35	... 1.35
tanks, wks.....100 lb.	...	1.00	...	1.00	... 1.00
20 degrees, cbys wks. 100 lb.	...	1.45	...	1.45	... 1.45
N & W.....250 lb bbls.	.85	.95	.85	.95	.85 .95
Naphthenic, drums .....lb.	.12	.13	.10	.13	.10 .11½
Naphthionic, tech.....250 lb.	.60	.65	.60	.65	.60 .65
Nitric, 36 deg, 135 lb cbys c-wks .....100 lb.	...	5.00	...	5.00	... 5.00
40 deg, 135 lb cbys, c-1 wks.....100 lb.	...	6.00	...	6.00	... 6.00
Oxalic, 300lb bbls wks NY..lb.	.11⅞	.12⅜	.11⅞	.12⅜	.11 .12⅜
Phosphoric 50%, USP....lb.	...	.14	...	.14	... .14
50%, acid, c.l. drums..lb.	.05	.05	.05	.05	.05 .05
75%, acid, c.l. drums..lb.	.07	.07	.07	.07	.07 .07
Picramic, 300 lb bbls.....lb.	.65	.70	.65	.70	.65 .70

†Anhydrous 5c higher *Delivered metropolitan area, basic price 33c. §Higher price is refrigeration grade.

the cost of tax paid ethyl alcohol. Quotation above includes this tax. Grain alcohol is 20c a gal. higher.

Picric, kegs.....lb.	.30	.50	.30	.50	.30	.50
Pyrogallic, crystals .....lb.	1.60	1.65	1.40	1.65	1.40	1.45
Salicylic, tech, 125 lb bbl..lb.	.33	.37	.33	.37	.33	.37
Sebacic, tech, drum.....lb.	.58	.58	.58	.58	.58	.58
Sulfanilic, 250 lb. bbls....lb.	.18	.19	.18	.19	.15	.17
Sulfuric, 66 deg, 180 lb. cbys tc-1 wks.....100 lb.	1.60	1.95	1.60	1.95	1.60	1.95

* Delivered Metropolitan area.

	Current Market	1934 Low	1934 High	1933 Low	1933 High
tanks, wks.....ton	...	15.00	...	15.00	... 15.00
1500 lb dr wks....100 lb.	1.50	1.65	1.50	1.65	1.50 1.65
60°, 1500 lb dr wks..100 lb.	1.27½	1.42½	1.27½	1.42½	127½ 1.42½
Oleum, 20%, 1500 lb. drs 1c-1 wks.....ton	...	18.50	...	18.50	... 18.50
40%, 1c-1 wks net.....ton	...	42.00	...	42.00	... 42.00
Tannic, tech, 300 lb bbls.lb.	.23	.40	.23	.40	.23 .40
Tartaric, USP, gran. powd, 300 lb bbls.....lb.	...	.25	.25	.26	.20 .25
Tobias, 250 lb bbls.....lb.	.75	.80	.75	.80	.75 .80
Trichloroacetic bottles..lb.	2.00	2.75	2.00	2.75	2.00 2.75
Kegs .....lb.	...	1.75	...	1.75	... 1.75
Tungstic, bbls.....lb.	1.35	1.45	1.35	1.70	1.40 1.70
Albumen, blood,225 lb bbls.lb.	.45	.53	.35	.53	.35 .43
dark .....bbls., lb.	.12	.17	.10	.17	.10 .17
Egg, edible .....lb.	.87	.90	.82	.92	.74 .90
Technical, 200 lb cases.lb.	.62	.66	.62	.66	.62 .66
Vegetable, edible.....lb.	.65	.70	.65	.70	.60 .70
Technical .....lb.	.50	.55	.50	.55	.50 .55
Alcohol Amyl (from pentane) Tanks, del.....lb.	...	.143	...	.143	.143 .176
Drums, del.....lb.	.15	.157	.15	.157	... ...
Tertiary, drums, del....lb.	.082	.093	.082	.093	... ...
Tanks, del.....lb.	...	.052	...	.052	... ...
Alcohol Butyl, Normal, 50 gal drs c-l wks.....lb.	...	.13	.10½	.13	... .10½
Drums, l-c-l wks.....lb.	...	.13½	.11	.13½	... .11
Tank cars, wks.....lb.	...	.12	.09½	.12	... .09½
Secondary tank .....lb.	...	.096	.076	.096	... ...
drums carlots .....lb.	...	.086	...	.086	... ...
Capryl, tech, drums....lb.	...	.85	...	.85	... .85
Diacetone, tanks .....lb.	.16	.17	.15¾	.17	.15¼ .16¾
Ethyl, USP, 190 pf, 50 gal. bbls .....gal.	...	4.15½	4.12½	4.24½	2.44½ 2.65
No. 5. *188 pf, 50 gal. drs., drums extra..gal.	.34*	.421*	.30*	.421*	... ...
No. S. D. 1, tanks...gal.	...	.295	.29½	.304	... .304
Furfuryl, tech., 500 lb. drs. .....lb.	...	.35	.35	.40	.40 .45
Isobutyl, ref., gal. drs..gal.	...	.60	.60	.75	... .75
Isopropyl, ref, gal drs..gal.	...	.45	.45	.50	.45 .50
Propyl Normal, 50 gal dr. .....gal.	...	.75	...	.75	... .75
Aldehyde Ammonia, 100 gal. dr. .....lb.	.80	.82	.80	.82	.80 .82
Alpha-Naphthol, crude, 300 lb. bbls. .....lb.	.65	.70	.65	.70	.65 .70
Alpha-Naphthylamine, 350 lb. bbls. .....lb.	.32	.34	.32	.34	.32 .34
Alum Ammonia, lump, 400 lb. bbls, 1-c-1 wks..100 lb.	2.90	3.25	3.00	3.25	3.00 3.25
Chrome, 500 lb casks, wks .....100 lb.	7.00	7.25	6.50	7.25	4.50 6.50
Potash, lump, 400 lb casks wks .....100 lb.	2.90	3.25	3.00	3.50	3.00 3.50
Soda, ground, 400 lb bbls wks .....100 lb.	3.50	3.75	350	3.75	3.50 3.75
Aluminum Metal, c-1 NY .....100 lb.	20.00	23.30	20.00	24.30	22.00 24.30
Chloride Anhyd., 99%, wks .....lb.	.07	.12	.07	.12	... ...
93% grade, wks.....lb.	.04	.08	.04	.08	... ...
Hydrate, 96%, light, 90 lb. bbls. .....lb.	.13	.15	.13	.16½	.15 .16½
Oleate, drums.....lb.	...	.15¾	...	...	... ...
Palmitate, bbls. .....lb.	.20	.21	.19	.21	... ...
Resinate, pp., bbls. ....lb.	....	.15	.12½	.15	... ...
Stearate, 100 lb bbls.....lb.	.17	.19	.17	.18	.12½ .18
Sulfate, Iron, free, bags c-1 wks .....100 lb.	1.90	1.95	1.90	1.95	1.90 1.95
Coml, bags c-1 wks 100 lb.	1.35	1.50	1.35	1.50	1.25 1.50
Aminoazobenzene, 110 lb kegs .....lb.	...	1.15	...	1.15	... 1.15
Ammonia					
Ammonia anhydrous Com. tks.	.04½	.05½§	.04½	.05½§	.04½ .05½
Ammonia anhyd, 100 lb cyl lb.	.15¼	.15½	.15¼	.15½	.15¼ .15½
Water, 26°, 800 lb dr del..lb.	.02½	.03	.02½	.03	.02½ .03
Ammonia, aqua 26° tanks.. NH cont.....	...	.05	...	.05	... .05
Ammonium Acetate.....lb.	.26	.33	.26	.33	.26 .33
Bicarbonate, bbls., f.o.b. plant .....100 lb.	...	5.15	...	5.15	... 5.15
Bifluoride, 300 lb bbls..lb.	.15¼	.17	.15¼	.17	.15¼ .17
Ammonium carbonate, tech, 500 lb cs.....lb.	.08	.12	.08	.12	.08 .12
Chloride, White, 100 lb. bbls, wks .....100 lb.	5.00	5.25	5.00	5.25	4.45 5.25
Gray, 250 lb bbls wks.lb.	5.25	5.75	5.25	5.75	5.25 5.75
Lump, 500 lbs cks spot.lb.	.10	.11	.10	.11	.10 .11
Lactate, 500 lb bbls.....lb.	.15	.16	.15	.16	.15 .16
Linoleate .....lb.	...	.12	.11	.12	... .11
Nitrate, tech, casks.....lb.	.03¾	.05	.03¾	.05	.03¾ .10
Oleate, drs.....lb.	...	.10	...	.10	... .10
Persulfate, 112 lb kegs..lb.	.22½	.25	.20	.25	.20 .22½
Phosphate, tech, powd, 325 lb. bbls .....lb.	.08	.10	.08	.11½	.08½ .11½

Prices Current

Ammonium Sulfate
Butyl Carbitol

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Ammonium sulfate, bulk c-l ....100 lb.	...	1.20	1.10	1.25	1.00	1.25
Sulfocyanide, kegs .....lb.	...	.50	...	.50	.36	.50
Amyl Acetate, (from pentane) Tanks del.....lb.	...	.13½	...	.13½	...	.13½
Tech., drs., del.....lb.	.142	.149	.142	.149	.138	.149
Secondary, tanks .....lb.	...	.108	.09	.108	...	.09
Amyl Alcohol, see also Fusel Oil						
Amyl Alcohol, sec.....lb.	...	.08½	.08½	.08½	...	...
Chloride, normal, drums, wks. .....lb.	.56	.68	.56	.68	...	...
Chloride, mixed, drums, wks. .....lb.	11.5	12.2	11.5	12.2	...	...
tank wks. .....lb.	...	10.5	...	10.5	...	...
Lactate, wks, drums....lb.	...	.50	...	.50	...	...
Mercaptan, wks, drums.lb.	...	1.10	...	1.10	...	...
Stearate, wks, drums...lb.	...	.31	...	.31	...	...
Amylene, drums, wks.....lb.	.10	.11	.10	.11	...	...
tanks, wks. .....lb.	...	.09	...	.09	...	...
Aniline Oil, 960 lb drs & tks .....lb.	.15	.17½	.15	.17½	.14½	.16
Annatto fine .....lb.	.34	.37	.34	.37	.34	.37
Anthracene, 80% .....lb.	...	.75	...	.75	...	...
40% .....lb.	...	.18	...	.18	...	...
Anthraquinone, sublimed, 125 lb. bbls. .....lb.	.45	.50	.45	.50	...	.45
Antimony, metal slabs, ton lots .....lb.	...	.08⅞	.07	.08⅞	.05⅝	.07½
Needle, powd., bbls....lb.	.07	.08	.07	.09	.07	.09
Chloride, soln (butter of) chys .....lb.	.13	.17	.13	.17	.13	.17
Oxide, 500 lb bbls.....lb.	.08¼	.09½	.08	.11	.07½	.11
Salt, 63% to 65%, tins..lb.	.22	.24	.22	.24	.20	.24
Sulfuret, golden, bbls...lb.	.16	.20	.16	.20	.16	.20
Vermilion, bbls. .....lb.	.35	.42	.35	.42	.38	.42
Archil, conc., 600 lb bbls.lb.	.21	.27	.21	.27	.20	.21
Double, 600 lb bbls.....lb.	.18	.20	.18	.20	.16	.17
Triple, 600 lb bbls.....lb.	.18	.20	.18	.20	.16	.17
Argols, 80%, casks.....lb.	.15	.16	.15	.16	.12	.15
Crude, 30%, casks.....lb.	.07	.08	.07	.09	.06¾	.09
Aroclors, wks. .....lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbl. .....lb.	.08¾	.09¾	.08¾	.09¼	...	...
Arsenic, Red, 224 lb cs. kegs .....lb.	.15	.15½	.14	.15½	.09⅜	.14¾
White, 112 lb kegs....lb.	.03½	.04½	.03½	.05	.04	.05
Metal .....lb.	.40	.42	.40	.45	...	...
Asbestine, c-l wks.....ton	13.00	15.00	13.00	15.00	13.00	15.00
Barium Carbonate, precip, 200 lb. bags wks‡...ton	56.50	61.00	56.50	61.00	56.50	61.00
Nat. (witherite) 90% gr. car-lots wks bags....ton	...	45.00	...	45.00	...	...
Chlorate, 112 lb kegs NY.lb.	.15	.16	.15	.16	.13¾	.16
Chloride, 600 lb bbl wks..ton	72.00	74.00	72.00	74.00	61.50	74.00
Dioxide, 88%, 690 lb drs.lb.	.11	.13	.11	.13	.11	.13
Hydrate, 500 lb bbls....lb.	.05	.06	.04¾	.06	.04¼	.05
Nitrate, 700 lb casks....lb.	...	.08¼	...	.08¼	...	.07¼
Barytes, Floated, 350 lb bbls wks .....ton	23.00	30.50	23.00	30.50	22.20	30.50
Bauxite, bulk, mines.....ton	7.00	10.00	5.00	10.00	5.00	6.00
Bayberry, bags .....lb.	.26	.30	.25	.30	.14½	.17
Beeswax, Yel., crude bags.lb.	.21½	.22	.16	.22	.13	.20
Refined, cases .....lb.	.26	.29	.21	.29	.18	.26
White, cases .....lb.	.34	.37	.32	.37	.30	.35
Benzaldehyde, technical, 945 lb. drums wks.....lb.	.60	.65	.60	.65	.60	.65
Benzene, 90%, Industrial, 8000 gal tanks wks..gal.	...	.19	.19	.20½	.20	.22
Ind. Pure, tanks wks..gal.	...	.19	.19	.20½	.20	.22
Benzidine Base, dry, 250 lb. bbls. .....lb.	.67	.69	.67	.69	.65	.67
Benzoyl, Chloride, 500 lb drs. .....lb.	.40	.45	.40	.45	.40	.45
Benzyl Chloride, tech drs.lb.	...	.30	...	.30	...	.30
Beta-Naphthol, 250 lb bbl wk ..... lb.	...	.24	...	.24	...	.24
Naphthylamine, sublimed, 200 lb bbls .....lb.	1.25	1.35	1.25	1.35	1.25	1.35
Tech, 200 lb bbls.....lb.	.53	.58	.53	.58	.53	.58
Bismuth, metal	...	1.20	1.20	1.30	.85	1.30
Bismuth, Subnitrate	1.55	1.60	1.40	1.60	.95	1.40
Blackstrap, cane, (see Molasses, Blackstrap)						
Blanc Fixe, 400 lb bbls wks .....ton	42.50‡	70.00	42.50‡	70.00	42.50	75.00
Bleaching Powder, 800 lb drs c-l wks contract..100 lb.	...	1.90	...	1.90	1.75	1.90
Blood, dried, fob, NY..unit	...	3.00	2.40	3.25	1.55	2.75
Chicago, high grade...unit	...	3.25	2.00	3.10	...	...
S. American shipt.....unit	...	3.10	2.75	3.20	1.90	3.00
Blues, Bronze Chinese Milori Prussian Soluble.....lb.	.35½	.37½	.35½	.37½	...	.35
Bone, raw, Chicago.....ton	21.00	22.00	20.00	25.00	19.00	28.00
Bone Ash, 100 lb kegs....lb.	.06	.07	.06	.07	.06	.07
Black, 200 lb. bbls.....lb.	.05½	.08¼	.05½	.08¼	.05½	.08
Meal, 3% & 50%, Imp..ton	...	23.50	16.00	24.00	18.00	27.50
Borax, bags .....lb.	.018	.02	.018	.02	.018	.02
Bordeaux, Mix. 16% pwd..lb.	.08	.16½	.08	.16½	.11½	.13
Brazilwood, sticks, shpmt..lb.	26.00	28.00	26.00	28.00	26.00	28.00
Bromine, cases.....lb.	.36	.43	.36	.43	.36	.43
Bronze, Alumi., pwd blk..lb.	.50	.75	.50	.75	.50	.75
Gold bulk .....lb.	.40	.55	.40	.55	.40	.55
Butanes, com 16.32° group 3 tanks .....lb.	.02¾	.04	.02¾	.04	.02¾	.04
Butyl, Acetate, normal drs..lb.	.13	.14	.11	.14	.11	.139
Tank, wks. .....lb.	.12	.13	.10	.13	.10	.124
Secondary tanks, wks...lb.	...	.08	...	.08	...	...
Aldehyde, 50 gal drs wks lbs.	.18	.19	.19	.36	.31½	.36
Carbitol see Diethylene Glycol Mono (Butyl Ether).	...	...	...	...	...	...

‡Lowest price is for pulp; highest for high-grade precipitate.

' ' ' Recent CHEMICAL Developments

X

1. MAINTENANCE PAINT

For maintenance work, Tornesit, the new chlorinated rubber paint, is particularly valuable. It is long lasting and highly resistant to petroleum, alcohol, oils, acids, alkalies, salts, and water.

2. OIL-RESISTANT FINISHES

A highly oxidized resin, insoluble in petroleum oils and solvents, is now available. It offers interesting possibilities for use in oil-resistant finishes and electrical insulation in place of hard-wood pitches and fossil resins.

3. QUICK-DRYING INKS

Nitrocellulose in printing inks allows the elimination of slow-drying materials and the use of highly volatile solvents, which promotes rapid drying.

4. PROTECTS OIL PIPE LINES

Coatings made from a highly oxidized resin, which is insoluble in petroleum oils and thinners, provide a cheap, durable, oil-resistant protection for oil pipe lines.

5. FINE TRACING PAPER

A tracing paper of superior transparency and strength is made by coating thin sheets of paper with clear nitrocellulose lacquer. It can be made for either ink or pencil.

6. SYNTHETIC TERPINEOL AND BORNEOL

Recently crude alpha terpineol and crude borneol derived from pine oil have largely supplanted turpentine for use in the manufacture of synthetic terpineol and borneol.

7. PREVENTS MOULDING

Cardboard containers for soap and other products are protected from moulding and staining by the use of nitrocellulose lacquers.

8. POLYMERIZED TURPENTINE

Polymerization of turpentine yields polymers ranging from high-boiling liquids to resinous solids. They have possibilities in insulating compounds, protective coatings, printing inks, and adhesives. They are neutral, relatively non-volatile, miscible with most solvents and oils, and they harden slowly.

More detailed information on any of the above subjects may be secured by filling in this coupon.

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Butyl Carbinol
Cobalt Acetate

Prices

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Butyl carbinol, sec., drums..lb.	.60	.75	.60	.75	...	...
Carbinol, normal, drms, wks, ...lb.	.60	.75	.60	.75	...	...
Cellosolve (see Ethylene glycol mono butyl ether)						
Furoate, tech, 50 gal dr..lb.	...	.65	.60	.65	.50	.60
Lactate drums .....lb.	...	.23½	.23½	.29	...	...
Propionate, drs.....lb.	.17	.18	.17	.22	.20	.22
Stearate, 50 gal drs.....lb.	...	.26	.25	.26	.25	.25
Tartrate, drs.....lb.	.55	.60	.55	.60	.55	.60
Cadmium, Sulfide, boxes..lb.	.70	.75	.65	.75	.65	.75
Calcium, Acetate, 150 lb bags c-l .....100 lb.	...	2.25	2.25	3.00	2.50	3.00
Arsenate, 100 lb bbls c-l wks .....lb.	...	.06	.05	.07	.05½	.07
Carbide, drs.....lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bags c-l.....lb.	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, Flake, 375 lb drs c-l wks.....ton	...	19.50	...	19.50	19.50	21.00
Solid, 650 lb drs c-l fob wks .....ton	...	17.50	...	17.50	17.50	18.00
Ferrocyanide, 350 lb. f.o.b. wks. .....lb.	...	.17	...	.17	.17	.17
Furoate, tech, 100 lb.dr..lb.	...	.25	.25	.30	...	.30
Gluconate, tech, 125 lb. bbls. .....lb.	...	.28	.25	.28	...	...
Nitrate, 100 lb bags....ton	...	26.50	...	26.50	24.00	26.50
Palmitate, bbls. .....lb.	.20	.21	.19	.20	.16	.19
Perioxide, 100 lb drs....lb.	...	1.25	...	1.25	...	1.25
Phosphate, tech, 450 lb bbls. .....lb.	.07½	.08	.07½	.08	.07½	.08
Resinate, precip., bbls...lb.	.13	.14	.13	.14	...	...
Stearate, 100 lb. bbls....lb.	.17	.19	.17	.19	.12½	.18
Camphor, slabs .....lb.	.52	.53	.51	.59	.35½	.59
Powder .....lb.	.52	.53	.51	.59	.38	.59
Camwood, Bk, ground bbls..lb.	.16	.18	.16	.18	.16	.18
Candelilla Wax, bags.....lb.	.12½	.113	.10¼	.14½	.09	.11
Carbitol, (See Diethylene Glycol Mono Ethyl Ether)..	...	...	...	...	...	...
Carbon, Decolorizing, drums c-l .....lb.	.08	.15	.08	.15	.08	.15
Black, 100-300 lb cases1c-1 NY .....lb.	.07	.08¼	.06½	.08¼	.06	.12
Bisulfide, 500 lb drs 1c-1 NY .....lb.	.05½	.06	.05½	.06	.05½	.06
Dioxide, Liq. 20-25 lb. cyl. .....lb.	...	.06	...	.06	...	.06
Tetrachloride, 1400 lb drs delivered .....lb.	.05¼	.06	.05¼	.06	.05¼	.07
Carnauba Wax						
No. 1 Yellow, bags.....lb.	...	.37	.30	.37	.20	.35
No. 2 N Country, bags..lb.	...	.28	.20	.28	.14	.20
No. 3 N. C.....lb.	.23	.24	.16¼	.24¾	.11½	.17
Casein, Standard, Domestic ground .....lb.	.10¾	.12	.10¾	.13	.06½	.15
80-100 mesh c-l, bags...lb.	.11¼	.14	.11¼	.14	...	...
Cellosolve (see Ethylene glycol mono ethyl ether)....						
Acetate (see Ethylene glycol mono ethyl ether acetate)						
Celluloid, Scraps, Ivory cs.lb.	...	.18	.13	.18	.13	.15
Transparent, cases .....lb.	...	.20	.16	.20	...	.16
Cellulose, Acetate, 50 lb kegs .....lb.	.55	.60	.55	.90	.80	.90
Chalk, dropped, 175 lb bbls.lb.	.03	.03¾	.03	.03¾	.03	.03¾
Precip, heavy, 560 lb cks.lb.	.03	.04	.03	.04	.02	.03½
Light, 250 lb casks.....lb.	.03	.04	.03	.04	.02½	.03½
Charcoal, Hardwood, lump, bulk wks .....bu.	...	.20	.18	.20	.18	.19
Willow, powd, 100 lb bbl. wks .....lb.	.06	.06¼	.06	.06¼	.06	.06¼
Wood, powd, 100 lb. bbls.lb.	.04	.05	.04	.05	.04	.05
Chestnut, clarified bbls wks.lb.	.01⅝	.01¾	.01⅝	.01¾	.01¼	.02
25% tks wks.....lb.	...	.01½	.01¼	.01½	.012	.01⅝
Pwd, 60%, 100 lb. bags wks. .....lb.	...	.04⅞	...	.04⅞	...	.04¾
Powd, decol. bgs wks...lb.	.05	.05¼	.05	.05¼	.04¾	.05
China Clay, lp, blk mines.ton	8.00	9.00	8.00	9.00	8.00	9.00
Powdered, bbls.....lb.	.01	.02	.01	.02	.01	.02
Pulverized, bbls wks...ton	10.00	12.00	10.00	12.00	10.00	12.00
Imported, lump, bulk..ton	15.00	25.00	15.00	25.00	15.00	25.00
Chlorine, cyls 1c-1 wks contract .....lb.	.07	.08½	.07	.08½	.07	.08½
cyls, cl., contract.....lb.	...	.05½†	...	.05½†	...	.05½
Liq tank cyls wks contract .....100 lb.	...	1.85	...	1.85	1.75	1.85
Multi c-l cyls. wks cont..lb.	2.00	2.25	2.00	2.25	...	...
Chlorobenzene, Mono, 100 lb. drs 1c-1 wks.....lb.	.06	.07½	.06	.07½	.06	.07½
Chloroform, tech, 1000 lb drs .....lb.	.20	.21	.20	.21	.15	.20
USP, tins.....lb.	.30	.31	.30	.35	...	...
Chloropicrin; comml cyls.lb.	.85	.90	.85	1.25	.90	1.35
Chrome, Green, CP.....lb.	.20	.30	.20	.30	.28	.29
Commercial .....lb.	.06¼	.10	.06¼	.10	.06¼	.10
Yellow .....lb.	.15	.16	.15	.16	.14	.16
Chromium, Acetate, 8% Chrome bbls .....lb.	.05	.05¾	.05	.05¾	.04¾	.05¾
20° soln, 400 lb. bbls..lb.	...	.05½	...	.05½	...	.05½
Fluoride, powd, 400 lb. bbl. .....lb.	.27	.28	.27	.28	.27	.28
Oxide, green, bbls.....lb.	.22	.23	.22	.23	.19	.23
Coal tar, bbls.....bbl.	8.50	9.00	8.50	9.00	8.50	9.00
Cobalt Acetate, bbls.....lb.	...	.60	.60	.80	...	...
Carbonate tech., bbls...lb.	1.35	1.40	1.34	1.40	...	...
Hydrate, bbls .....lb.	1.66	1.76	1.66	1.76	...	...
Linoleate, paste, bbls....lb.	...	.30	.30	.40	...	...
Resinate, fused, bbls....lb.	...	.12½	...	.12½	...	...
Precipitated, bbls .....lb.	...	.32	.32	.42	.41	.42

† Delivered.

Current

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Cobalt Oxide, black, bags..lb.	1.25	1.35	1.25	1.35	1.15	1.35
Cochineal, gray or bk. bg..lb.	.35	.40	.35	.42	.36	.42
Teneriffe silver, bags...lb.	.36	.40	.36	.43	.37	.43
Copper, metal, electrol 100 lb.	...	9.00	7.87½	9.00	5.00	9.00
Carbonate, 400 lb bbls..lb.	...	.08¼	...	.08¼	.07	.08
52-54% bbls.....lb.	.15½	.16¼	.15½	.16	.15¾	.17¼
Chloride, 250 lb bbls....lb.	.17	.18	.17	.18	.17	.18
Cyanide, 100 lb drs.....lb.	.37	.38	.37	.40	.39	.40
Oleate, precip., bbls.....lb.	...	.20	...	.20	...	...
Oxide, red, 100 lb bbls..lb.	.15	.17	.12½	.17	.14¾	.15
Resinate, precip., bbls..lb.	.18	.19	.18	.19	...	...
Stearate, precip., bbls...lb.	.35	.40	.35	.40	...	...
Sub-acetate verdigris, 400 lb. bbls.....lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls c-l wks.100 lb.	...	3.85	3.75	3.85	3.00	3.75
Copperas, crys and sugar bulk c-l wks bags.....ton	14.00	14.50	14.00	14.50	14.00	14.50
Corn Syrup, 42 deg., bbls. ..... 100 lb.	...	2.59	3.04	3.59	2.61	3.04
43 deg., bbls.....100 lb.	...	3.64	3.09	3.64	2.66	3.09
Cotton, Soluble, wet, 100 lb. bbls. .....lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, USP, powd., & gran., 300 lb. bbls..lb.	...	.18¼	.17½	.19½	.14½	.17¾
Creosote, USP., 42 lb cbys lb.	.45	.47	.45	.47	.40	.47
Oil, Grade 1 tanks...gal.	.11	.12	.11	.12	.11	.12
Grade 2.....gal.	.10	.12	.10	.12	.10	.12
Grade 3.....gal.	.09	.12	.09	.12	.09	.12
Cresol, USP. drums....lb.	...	.11	...	.11	.10½	.11
Crotonaldehyde, 98% 50 gal. dr. .....lb.*	.26	.30	.26	.30	.32	.36
Cudbear, English .....lb.	.19	.25	.19	.25	.16	.25
Cutch, Rangoon, 100 lb. bales .....lb.	...	.02¾	...	.02¾	.02½	.03
Borneo, Solid, 100 lb. bale .....lb.	...	.04½	...	.04½	.02½	.04½
Philippine, 100 lb bale .lb.	.03½	.04¾	.03½	.04¾	...	...
Cyanamid, bags c-l frt allowed Ammonia unit..	...	1.07½	...	1.07½	.97½	1.07½
Dextrin, corn, 140 lb bags ..... 100 lb.	4.05	4.20	3.50	4.20	2.89	3.84
British Gum, bags..100 lb.	4.30	4.60	3.75	4.60	3.89	3.92
White, 140 lb. bags.100 lb.	4.00	4.20	3.47	4.20	2.94	3.79
Potato Yellow, 220 lb bgs .....lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.09
White, 220 lb bags 1c-l lb	.08	.09	.08	.09	.08	.09
Tapioca, 200 bags 1c-l.lb.	.06¾	.07¾	.06¾	.07¾	.06¾	.08
Diamylamine, drums, wks.lb.	...	1.00	...	1.00	...	...
Diamylene, drums, wks..lb.	.09	.10	.09	.10	...	...
tanks, wks .....lb.	...	.08½	...	.08½	...	...
Diamylether, wks., drums.lb.	...	.09	.09	.77	...	...
Diamylphthalate, drs wks.gal.	...	.20½	...	.20½	...	...
Diamyl Sulfide, drms, wks.lb.	...	1.10	...	1.10	...	...
Dianisidine, barrels .....lb.	2.35	2.45	2.35	2.45	2.35	2.70
Dibutylphthalate, drs, wks..lb.	.22	.23	.20½	.21	.20½	.22
Dibutyltartrate, 50 gal drs lb.	.29½	.31½	.29½	.31½	.29½	.21
Dichlorethylene, drums...gal.	.29	...	.29	...	...	...
Dichloroethylether, 50 gal drs. .....lb.	...	.21	...	.21	.16	.21
Dichloromethane, drs wks.lb.	...	.15	...	.15	...	...
tanks, wks .....lb.	...	.02½	...	.02½	...	...
Dichloropentanes, drums, wks. ..... lb.	.0278	.036	.0278	.036	...	...
tanks, wks.....lb.	...	.02½	...	.02½	...	...
Diethylamine, 400 lb drs..lb.	2.75	3.00	2.75	3.00	2.75	3.00
Diethyl Carbinol, drums..lb.	.60	.75	.60	.75	...	...
Diethylcarbonate, com. drs lb.	...	.35	...	.35	...	...
90% grade, drs.....lb.	...	.25	...	.25	...	...
Diethylaniline, 850 lb drs lb.	.52	55	.52	.55	.52	.55
Diethyleneglycol, drs ....lb.	.14	.16	.14	.16	.14	.16
Mono ethyl ether, drs.lb.	.15	.16	.15	.16	.15	.16
Mono butyl ether, drs.lb.	...	.26	...	.26	...	.26
Diethylene oxide, 50 gal drs ..... lb.	.26	.27	.26	.27	.26	.27
Diethylorthotoluidin, drs..lb.	.64	.67	.64	.67	.64	.67
Diethyl phthalate, 1000 lb. drums .....lb.	.26	.27	.26	.27	.20	.26
Diethysulfate, technical, 50 gal drums .....lb.	...	...	...	...	...	...
Diglycol Oleate, 5bls.....lb.	...	.18	.16	.18	...	...
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis .....lb.	...	.95	.95	1.20	...	...
Dimethylaniline, 340 lb drs lb.	.29	.30	.29	.30	.25	.28
Dimethyl Ethyl Carbinol, drs. .....lb.	.60	.75	.60	.75	...	...
Dimethyl phthalate drs....lb.	.23	.24	.24	.24½	...	...
Dimethysulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls lb.	.17	.19½z	.17	.19½z	...	.18
Dintrochlorobenzene, 400 lb bbls. .....lb.	.14	.15½	.14	.15½	.13	.15
Dinitronaphthalene, 350 lb bbls .....lb.	.34	.37	.34	.37	.34	.37
Dinitrophenol, 350 lb bbls lb.	.23	.24	.23	.24	.23	.24
Dinitrotoluene, 300 lb bbls lb.	...	.16½	.15½	.16½	.15	.17
Dioxan (See Diethylene Oxide)	...	...	...	...	...	...
Diphenyl .....lb.	.15	.25	.15	.25	.15	.40
Diphenylamine .....lb.	.33	.34	.31	.34	.31	.34
Diphenylguanidine, 100 lb bbl ..... lb.	.36	.37	.36	.37	.30	.37
Dip Oil, 25%, drums.....lb.	.23	.25	.23	.25	.23	.25
Divi Divi pods, bgs shipmt .....ton	36.00	40.00	35.00	40.00	26.00	36.00
Extract .....lb.	.05	.05½	.05	.05½	.05	.05½
Egg Yolk, 200 lb. cases..lb.	.45	.47	.40	.47	.40	.43
Epsom Salt, tech, 300 lb bbls c-l NY .....100 lb.	...	2.25	2.20	2.25	...	2.20
Ether, USP anaesthesia 55 lb drs .....lb.	.22	.23	.22	.24	.22	.24
(Conc) .....lb.	.09	.10	.09	.10	.09	.10

‡Higher price refined. xTanks 2c lower. zHigher price for purified

Cobalt Oxide Ether

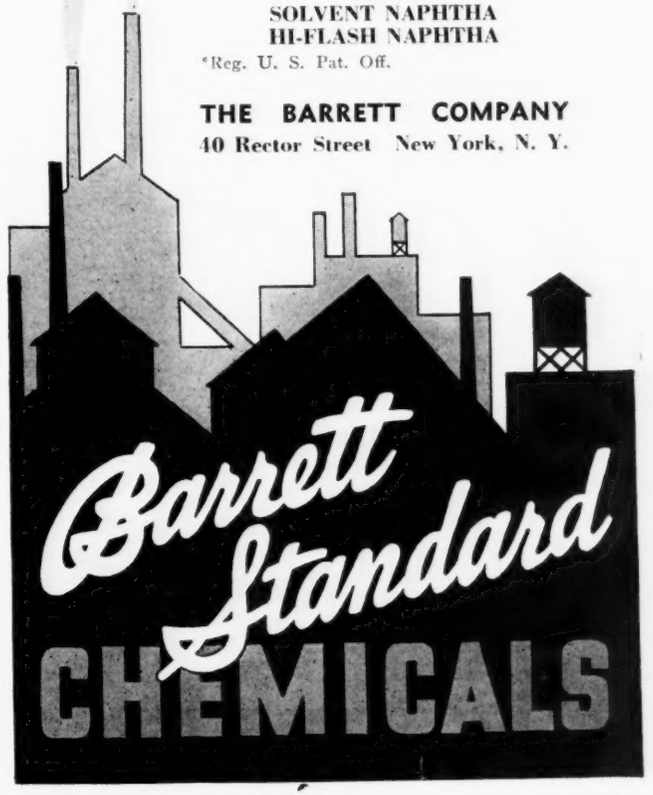
● Barrett Standard Chemicals are made to exact specifications by America's most experienced manufacturer of coal-tar products. A competent Barrett Technical Staff will gladly consult with you on the proper use of any Barrett Standard Chemical or on the development of special products to meet special specifications.

TRADE B MARK

PHENOL (Natural)
U.S.P. 39.5° M. Pt. and 40° M. Pt.
Technical 39° M. Pt.
Technical 82-84% and 90-92%
CRESOL
U.S.P., Meta Para, Ortho,
Special Fractions
CRESYLIC ACID
99% Straw Color and 95% Dark
XYLENOLS
TAR ACID OILS
NAPHTHALENE
Crude, Refined Chipped,
Flake and Ball
RUBBER SOFTENERS
CUMAR*
Paracoumarone-indene Resin
BARRETAN*
PICKLING INHIBITORS
PYRIDINE
Refined, Denaturing and
Commercial
PICOLINES
QUINOLINES
FLOTATION OILS and
REAGENTS
HYDROCARBON OIL
SHINGLE STAIN OIL
SPECIAL HEAVY OIL
BENZOL
TOLUOL
XYLOL
SOLVENT NAPHTHA
HI-FLASH NAPHTHA

*Reg. U. S. Pat. Off.

THE BARRETT COMPANY
40 Rector Street New York, N. Y.



The following

ORGANIC CHEMICALS

ARE AVAILABLE FOR SPOT OR CONTRACT SALE

1:2:4 ACID
ACETYL ORTHO-TOLUIDINE
ALPHA-NAPHTHOL
ALPHA-NAPHTHYLAMINE
ALPHA-NITRONAPHTHALENE
AMINOAZOBENZENE-SODIUM-SULFONATE
AMINOAZOTOLUENE
AMINO G SALT
AMINO J SALT
ANILINE
ANTIOXIDANTS
BENZIDINE (BASE)
BENZOIC ACID, TECHNICAL
BETA-HYDROXYNAPHTHOIC ACID
BETA-NAPHTHYLAMINE
BROENNER'S ACID
CATECHOL
CHICAGO ACID
CLEVE'S ACIDS
CRESIDINE
DENATURED ALCOHOLS
DIANISIDINE (BASE)
DIBENZYL-PARA-AMINOPHENOL
DIBUTYLAMINE
DIETHYLANILINE
DIETHYL-META-AMINOPHENOL
DIMETHYLAMINE
DIMETHYLANILINE
DINITROBENZENE
DINITROCHLOROBENZENE
DINITROPHENOL
DINITROSTILBENEDISULFONIC ACID
DINITROTOLUENE
DINITROTOLUENE OIL
DI-ORTHO-TOLYLTHIOUREA
DIPHENYLAMINE
EPSILON ACID
ETHER
ETHYLACETANILIDE
ETHYL ALCOHOL
ETHYLBENZYLANILINE
FLOTATION REAGENTS
GAMMA ACID
G SALT
INHIBITORS
J ACID
KOCH ACID
L ACID
LAURENT'S ACID
METANILIC ACID
META-NITROANILINE
META-NITRO-PARA-TOLUIDINE
META-NITROTOLUENE
META-PHENYLENEDIAMINE
META-TOLUIDINE
META-TOLYLENEDIAMINE
META-XYLIDINE

DUPONT
REG. U.S. PAT. OFF.

E. I. DU PONT DE NEMOURS & COMPANY, INC.
Organic Chemicals Department
Wilmington, Delaware

Ether, Isopropyl, Gum Copal Congo — Prices

		Current Market		1934 Low	1934 High	1933 Low	1933 High
Ether Isopropyl 50 gal. drums	lb.	.07‡x	.08	.07‡x	.08	.07	.08
Synthetic, wks, drums	lb.	.08	.09	.08	.09	...	...
Ethyl Acetate, 85% Ester tanks	lb.	.07½	.08	.07½	.08	.07½	.09
drums	lb.	.08½	.09	.08½	.09	.08½	.10
Anhydrous, tanks	lb.	.09	.10	.09	.10	.09	.10
drums	lb.	.10	.10¼	.10	.10¼	.10	.10¼
Acetoacetate, 50 gal drs	lb.	.65	.68	.65	.68	.65	.68
Benzylaniline, 300 lb drs	lb.	.88	.90	.88	.90	.88	.90
Bromide, tech, drums	lb.	.50	.55	.50	.55	.50	.55
Chloride, 200 lb drums	lb.	.22	.24	.22	.24	.22	.24
Chlorocarbonate cbys	lb.	...	.30	...	.30	...	.30
Crotonate, drums	lb.	1.00	1.25	1.00	1.25	...	...
Ether, Absolute, 50 gal drs	lb.	.50	.52	.50	.52	.50	.52
Lactate, drums works	lb.	.25	.29	.25	.33	.25	.29
Methyl Ketone, 50 gal drs	lb.	.08½	.09	.08½	.09	...	.12½
Oxalate, drums works	lb.	.37½	55	.37½	.55	.37½	.55
Oxybutyrate, 50 gal drs wks	lb.	.30	.30½	.30	.30½	.30	.30½
Ethylene Dibromide, 60 lb dr	lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont	lb.	.75	.85	.75	.85	.75	.85
Dichloride, 50 gal drums	lb.	.06	.09	.05½	.09	.05	.09
Glycol, 50 gal drs wks	lb.	.26	.28	.26	.28	.25	.28
Mono Butyl Ether drs wks		...	.20	...	.20	...	.20
Mono Ethyl Ether drs wk		.16	.17	.15	.17	.15	.17
Mono Ethyl Ether Acetate dr wks		17½	.18	.16½	.18	.16½	.18
Mono Methyl Ether, drs	lb.	.21	.23	.21	.23	.21	.23
Stearate		.18	.18	.18	.18	.18	.18
Oxide, cyl	lb.	...	.75	...	.75	...	.75
Ethylidenaniline	lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, bulk pottery	ton	...	14.50	...	14.50	14.00	16.50
Powdered, bulk works	ton	13.50	14.50	13.50	14.50	13.50	14.50
Ferric Chloride, tech, crystal 475 lb bbls	lb.	.05	.07½	.05	.07½	.04½	.07½
Fish Scrap, dried, wks	unit	...	2.50	2.25*	2.60*	1.85	2.75*
Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis	unit	...	2.00‡	2.00‡	2.50‡	1.85‡	2.50‡
Fluorspar, 98%, bags		28.00	35.50	28.00	35.50	28.00	35.50
Formaldehyde, aniline, 100 lb. drums	lb.	.37½	.42	.37½	.42	.37½	.42
USP, 400 lb bbls wks	lb.	.06	.07	.06	.07	.06	.07
Fossil Flour	lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, bulk, mines	ton	6.50	15.00	6.50	15.00	15.00	20.00
Imp. powd c-l bags	ton	24.00	30.00	23.00	30.00	24.00	30.00
Furfural (tech.) drums wks	lb.	.10§	.15	.10§	.15	.10	.15
Furfuramide (tech) 100 lb dr	lb.	...	.30	...	.30	...	.30
Furfuryl Acetate, 1 lb tins	lb.	...	5.00	...	5.00	...	5.00
Fusel Oil, 10% impurities	lb.	.16	.18	.16	.18	.14½	.18
Fustic, chips	lb.	.04	.05	.04	.05	.04	.05
Crystals, 100 lb. boxes	lb.	.20	.23	.20	.23	.18	.23
Liquid 50°, 600 lb. bbls	lb.	.08½	.12	.08½	.12	.07	.10
Solid, 50 lb. boxes	lb.	.16	.18	.16	.18	.14	.18
Sticks	ton	25.00	26.00	25.00	26.00	25.00	26.00
G Salt paste, 360 lb bbls	lb.	.42	.43	.42	.43	.42	.43
Gall Extract	lb.	.18	.20	.18	.20	.18	.20
Gambier, com. 200 lb. cs	lb.	...	.05¾	.04	.05¾	.03	.07
Singapore cubes, 150 lb. bg.	100 lb.	...	.06	.05	.07	.05¼	.08
Gelatin, tech, 100 lb cases	lb.	.50	.55	.45	.55	.45	.50
Glauber's Salt, tech, c-l wks.	100 lb.	1.10	1.30	1.10	1.30	1.00	1.70
Glucose (grape sugar) dry 70-80° bags c-l NY	100 lb.	3.24	3.34	3.24	3.34	3.24	3.34
Tanner's Special, 100 lb. bags	100 lb.	...	2.33	...	2.33	...	2.33
Glue, bone, com. grades, c-l bags	lb.	.07	.12½	.08	.12½	...	...
Better grades, c-l, bags	lb.	.12½	.16	.12½	.16	...	...
Casein, kegs	lb.	.18	.22	.18	.22	...	...
Hide, high grd, c-l. bags	lb.	.23	.28	.23	.28	...	...
Med. grd, c-l, bags	lb.	.19	.23	.19	.23	...	...
Low grade, c-l, bags	lb.	.13½	.19	.13½	.19	...	...
Glycerin, CP, 550 lb drs	lb.	...	.14	.11	.14	.10¼	.11
Dynamite, 100 lb drs	lb.	.13	.13½	.10	.13½	.07½	.10¼
Saponification, tanks	lb.	.09¾	.10	.06¾	.10⅛	.05	.08
Soap Lye, tanks	lb.	.08¾	.09	.06¼	.09⅛	.04	.06½
Glyceryl Phthallate	lb.	...	.28	...	.28	...	...
Glyceryl Stearate, bbls	lb.	...	.18	...	.18	.17	.18
Glycol Phthallate	lb.	...	.28	...	.28	...	...
Glycol Stearate	lb.	...	.20	...	.20	...	...
Graphite, Crystalline, 500 lb bbls	lb.	.04	.05	.04	.05	.04	.05
Flake, 500 lb. bbls	lb.	.08	.16	.08	.16	.08	.16
Amorphous, bbls.	lb.	.03	.04	.03	.04	.03	.04
GUMS							
Gum Aloes, Barbadoes	lb.	.87	.90	.85	.90	.85	.90
Animi (Zanzibar) bean & pea, 250 lb. cases	lb.	.35	.40	.35	.40	.35	.40
Glassy, 250 lb cases	lb.	.50	.55	.50	.55	.50	.55
Arabic, amber sorts	lb.	.09⅜	.10	.07¾	.10⅝	.05¾	.08¼
Asphaltum, Barbadoes (Manjak) 200 lb bags	lb.	.03	.04	.03	.06	.03	.05
Egyptian, 200 lb cases	lb.	.12	.15	.12	.15	.13	.15
Benzoin Sumatra, U.S.P. 120 lb. cases	lb.	.18	.18½	.18½	.23	.17	.23
Copal Congo, 112 lb. bags, clean, opaque†	lb.	.24⅛	.24⅝	.24⅛	.28	.16½	.28
Dark, amber†	lb.	.08¾	.09¾	.08⅝	.10½	.06	.10½
Light, amber†	lb.	.14⅝	.14⅞	.14⅜	.19	.08	.19

† Carlot (min. 30,000 lbs.) prices apply to assorted lots as well as carlot quantities of a single grade.
* & 10; ‡ & 50. § Tanks. 1c lower.

Current

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Gum Copal Congo					
Copal Congo water, white† lb.	.41⅝	.42⅛	.41⅝	.48	.37	.48
Damar Batavia standard 136,						
lb. cases† .....lb.	.13¼	.13¼	.12⅞	.13¾	.08½	.15½
Batavia Dust, 160 lb bags†.lb.	.05¾	.06¼	.05¾	.07	.04	.07½
E Seeds, 136 lb cases†..lb.	.07½	.08	.07½	.09½	.05½	.09½
F Splinters, 136 lb cases						
and bags .....lb.	.06⅛	.06⅝	.05½	.06⅝	.05½	.06
Singapore,						
No. 1, 224 lb cases†....lb.	.16½	.17	.15½	.18	.09½	.18
No. 2, 224 lb cases†....lb.	.10⅜	.10⅞	.09⅜	.11	.07	.11½
No. 3, 180 lb bags†....lb.	.05½	.06	.05⅛	.07	.04½	07½
Gum Ester, light .....lb.	.06¾	.07½	.06	.07½	...	...
Copal Manila 180-190 lb. baskets						
Loba A† .....lb.	.11⅜	.11⅞	.11⅜	.14½	.09	.13½
Loba B† .....lb.	.10¼	.10¾	.10¼	.13½	.08	.13
Loba C† .....lb.	.09¾	.10¼	.09¾	.12	.07	.12
M A Sorts† .....lb.	.07	.07¼	.06½	.07½	.05	.07
D B B Chips† .....lb.	.08	.08½	.08	.09½	.05¾	.09½
Copal East Indies chips, 180 lb. bags†						
..... lb.	.04	.04½	.04	.05	.04	.07
Pale bold, 224 lb cs†..lb.	...	.17	.16	.17	.05½	.17
Pale nubs, 180 lb bags†.lb.	.10½	.10¾	.10½	.13	.05	.13
Copal Pontianak, 224 lb cases						
Bold gen No. 1†....lb.	.17⅝	.18½	.17½	.19	.14	.18½
Gen. chips spot†.....lb.	.07⅝	.08⅛	.07¼	.08¼	.05	.08
Elemi, No. 1, 80-85 lb cs..lb.	.09⅞	.09⅝	.09¾	.11½	.09	.12½
No. 2, 80-85 lb cases..lb.	.09¼	.09½	.09¼	.11¼	.08½	.12
No. 3, 80-85 lb cases..lb.	.08	.08½	.08	.08½	.08	.08½
Gamboge, pipe, cases.....lb.	.60	.65	.57	.65	.42	.65
Powdered, bbls .....lb.	.70	.75	.67	.75	.50	.70
Ghatti, sol. bags.....lb.	.09	.09¼	.09	.09½	.06	.09½
Karaya, pow. bbls xxx....lb.	.23	.25	.23	.25	...	...
xx .....lb.	.15	.16	.15	.16	...	...
No. 1 .....lb.	.08	.09	.08	.11	...	...
No. 2 .....lb.	.07	.08	.07	.09	...	...
Kauri, 224-226 lb cs No. 1†lb.	.19	.19½	.19	.25	.20	.25
No. 2 fair pale†.....lb.	.14½	.15	.12½	.16	.12½	.16
Brown Chips, 224-226 lb.						
cases† .....lb.	.06½	.08½	.06½	.08½	.06½	.12
Bush Chips, 224-226 lb.						
cases† .....lb.	.22	.22½	.22	.24	.22	.24
Pale Chips, 224-226 lb.						
cases† .....lb.	.11½	.14	.11	.14	.11	.14
Kino, tins .....lb.	.75	.80	.75	.80	...	...
Mastic† .....lb.	.55	.55½	.35	.55½	.26⅞	.40
Sandarac, prime quality, 200						
lb bags & 300 lb casks.lb.	.48	.48½	.44	.50	.21	.50
Senegal, picked bags.....lb.	.20	.21	.17	.21	...	...
Sorts .....lb.	.09⅜	.10	.08	.10	...	...
Thus, bbls. .....280 lbs.	...	10.50	9.50	10.50	...	...
Strained .....280 lbs.	...	10.75	9.50	10.75	...	...
Tragacanth. No. 1 bags....lb.	1.15	1.20	1.00	1.20	.65	1.00
Yacca, bags .....lb.	.03¼	.03¾	.03¼	.04	...	...
Hematine crystals, 400 lb						
bbls. .....lb.	.16	.18	.16	.18	.10	.18
Paste, 500 bbls.....lb.	...	.11	...	.11	...	.11
Hemlock 25%, 600 lb. bbls.						
wks. .....lb.	.03½	.04½	.03½	.04½	.03½	.04½
Bark .....ton	...	16.00	...	16.00	...	16.00
Hexalene, 50 gal drs wks..lb.	...	.30	...	.30	...	.30
Hexane, normal 60-70°C.						
Group 3, tanks.....gal.	...	.14	...	.14	...	...
Hexamethylenetetramine,						
drums .....lb.	.37	.39	.37	.39	...	...
Hoof Meal, fob Chicago..unit	...	1.90	1.85	2.60	.75	1.75
South Amer. to arrive.unit	...	1.85	1.65	1.80	1.40	1.75
Hydrogen Peroxide, 100 vol,						
140 lb cbys.....lb.	.20	.21	.20	.21	.20	.21
Hydroxyamine Hydrochloride						
..... lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls.lb.	.17	.20	.17	.20	.11	.20
Indigo Madras, bbls.....lb.	1.25	1.30	1.25	1.30	1.25	1.30
20% paste, drums.....lb.	.15	.18	.15	.18	.15	.18
Synthetic, liquid .....lb.	...	.12	...	.12	...	.12
Iodine, crude .....per kilo	...	15s 1d	...	15s 1d	...	...
Resublimed, kegs .....lb.	...	1.90	1.90	2.30	2.10	3.40
Irish Moss, ord. bales....lb.	.07	.08	.07	.08	...	...
Bleached, prime, bales..lb.	.14	.15	.14	.15	...	...
Iron Acetate Liq. 17°,bbls.lb.‡	.03	.04	.03	.04	...	...
Iron Chloride see Ferric or Ferrous						
Nitrate, kegs .....lb.	.09	.10	.09	.10	.09	.10
Coml, bbls. .....100 lb.	2.75	3.25	2.75	3.25	2.50	3.25
Oxide, English.....lb.	.08¾	.09	.08¾	.09	.04	.07
Isobutyl Carbinol (128-132°C)						
drums, wks.....lb.	...	.329	.34	.329	...	.34
tanks, whks, lb.....lb.	...	.326	...	.326	...	...
Isopropyl Acetate, tanks...lb.	...	.07½	.07	.07½	...	...
Japan Wax, 224 lb cases..lb.	...	.07	.06	.08	.05½	.08
Keiselguhr, 95 lb. bgs. N.Y.						
Brown .....ton	60.00	70.00	60.00	70.00	60.00	70.00
Lead Acetate,bbls wks.100 lb.	...	9.50	...	9.50	8.50	9.50
White crystals, 500 lb bbls						
wks .....100 lb.	...	10.50	...	10.50	9.50	10.50
Arsenate, drs cl-lcl. wks.lb.	.09	.10½	.07	.18	.09	.10½
Linoleate, solid bbls.....lb.	.26	.26½	.26	.26½	...	...
Metal, c-l NY .....100 lb.	...	3.60	3.60	4.25	3.00	4.50
Nitrate, 500 lb bbls wks.lb.	.10	.14	.10	.14	.10	.14
Oleate, bbls. .....lb.	.15	.16	.15	.16	.15	.16
Lead Oxide Litharge, 500 lb.						
bbls. .....lb.	.051	.06¼	.051	.06¾	.05½	.07
Red, 500 lb bbls wks..lb.	.061	.065	.061	.07¾	.06½	.08
Resinate, precip., bbls..lb.	...	.14	.14	18½	...	...
Stearate, bbls. .....lb.	.22	.23	.22	.23	...	...
White, 500lb bbls wks.lb.	.06½	.07	.06½	.07	.06	.07
Sulfate,500lb bbls wks.lb.	...	.06	...	.06	.05½	.06
Lime, ground stone bags.ton	...	9.25	4.50	9.25	...	4.50
Lime Salts, see Calcium Salts						
Lime-Sulfur soln bbls....gal.	.13	.40	.13	.40	.15	.17
Linseed cake, bags.....ton	31.50	30.00	21.50	33.00	...	...

‡Higher price for lcl quantities.

† Carlot (min. 30,000 lbs.) prices apply to assorted lots as well as carlot quantities of a single grade.

The following

ORGANIC CHEMICALS

ARE AVAILABLE FOR SPOT OR CONTRACT SALE

MICHLER'S KETONE
MIXED-MONONITROCHLORO-BENZENES
MIXED-MONONITROTOLUENES
MIXED-MONONITROXYLENES
MIXED-TOLUIDINES
MIXED-XYLIDINES
MONOBENZYL PARA-AMINOPHENOL
MONOCHLOROBENZENE
MONOETHYLANILINE
MONOETHYL-ORTHO-TOLUIDINE
NEVILE & WINTHER'S ACID
NITROBENZENE
NITROBENZENE-META-SULFONIC ACID
NITRO FILTERS
OIL OF MIRBANE
ORTHO-AMINOPHENOL
ORTHO-ANISIDINE
ORTHO-DICHLOROBENZENE
ORTHO-NITROANISOLE
ORTHO-NITROCHLOROBENZENE
ORTHO-NITROPHENOL
ORTHO-NITROTOLUENE
ORTHO-TOLUIDINE
ORTHO-TOLUIDINE-META-SULFONIC ACID
PARA-AMINOBENZOIC ACID
PARA-AMINOPHENOL (BASE)
PARA-DICHLOROBENZENE
PARA-NITROANILINE-ORTHO-SULFONIC ACID
PARA-NITROBENZOIC ACID
PARA-NITROCHLOROBENZENE
PARA-NITROPHENOL
PARA-NITROTOLUENE
PARA-PHENETIDINE
PARA-TOLUIDINE
PERI ACID
PHENYL-ALPHA-NAPHTHYLAMINE
PHENYL-BETA-NAPHTHYLAMINE
PHENYL GAMMA ACID
PHENYL-METHYL-PYRAZOLENE
PHENYL PERI ACID
PICRAMIC ACID
PICRIC ACID
RESORCINOL, TECHNICAL
R SALT
S ACID
SCHAEFFER SALT
SODIUM METANILATE
SODIUM NAPHTHIONATE
SODIUM PARA-NITROPHENOLATE
SODIUM PICRAMATE
STABILIZERS
SULFANILIC ACID
SULFUR DIOXIDE
THIOCARBANILIDE
TOLIDINE (BASE)
TRIBUTYLAMINE

DU PONT
REG. U.S. PAT. OFF.

E. I. DU PONT DE NEMOURS & COMPANY, INC.
Organic Chemicals Department
Wilmington, Delaware

TRISODIUM
DISODIUM
PHOSPHATES
Brilliant, Colorless Crystals

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The exceptional purity of Bowker's Disodium Phosphate insures satisfactory results in the delicate operation of silk weighting and finishing.

Bowker's Phosphates are also being used successfully in treating water for high-pressure steam generation.

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The Willard is two blocks from the White House, across the street from N. R. A., centering theatre and shopping districts.

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Double Rooms with bath $6 up

Moderate Prices in Main Dining Room
Popular Price Coffee Shop

The WILLARD HOTEL
"Residence of Presidents"
WASHINGTON, D. C.
H. P. Somerville, Managing Director

Prices

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Linseed Meal, bags.....ton	38.50	41.00	30.50	41.00	28.00	37.00
Lithopone, 400 lb bbls lc-l wks .....lb.	.04¾	.05	.04¾	.05	.04¾	.05
Logwood, 51°, 600 lb bbls.lb.	.08½	.12½	.08½	.12½	.05	.12½
Solid, 50 lb boxes.....lb.	.14½	.17½	.14½	17½	.08	.17½
Sticks .....ton	24.00	26.00	24.00	26.00	24.00	26.00
Madder, Dutch .....lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbl.ton	60.00	65.00	55.00	65.00	46.00	65.00
Magnesium Carb, tech, 70 lb. bags NY .....lb.	...	.06½	...	.06½	.05¾	.06½
Chloride flake, 375 lb drs c-l wks .....ton	36.00	39.00	34.00	39.00	34.00	36.00
Imported shipment ...ton	31.75	33.00	31.75	33.00	31.75	33.00
Fused, imp., 900 lb bbls NY ..... ton	...	31.00	...	31.00	...	31.00
Magnesium Fluosilicate, crys, 400 lb bbls, wks.....lb.	.10	.10½	.10	.10½	.10	.10½
Oxide, USP, light, 100 lb. bbls .....lb.	...	.42	...	.42	...	.42
Heavy, 250 lb bbls....lb.	...	.50	...	.50	...	.50
Palmitate, bbls. .....lb.	.22	.23	.21	.23	...	...
Stearate, bbls. .....lb.	.19	.22	...	...	...	...
Linoleate, lig. drums....lb.	.18	.19	.18	.19	...	...
Resinate, fused, bbls....lb.	.08¼	.08½	.08¼	.08½	...	...
precip., bbls. .....lb.	...	.12	.11½	.12½	...	...
Sulfate, Anhyd., 550 lb drs N Y .....lb.	.09	.09½	.08	.09½	.07	.08
Manganese Borate, 30%, 200 lb. bbls. .....lb.	.15	.16	.15	.16	.15	.16
Chloride, 600 lb casks..lb.	.07	.08	.07	.08	.07	.08
Dioxide, tech (peroxide) drs ..... lb.	.03¾	.06	.03¾	.06	.03½	.06
Mangrove 55%,400 lb bbls.lb.	...	.04	...	.04	...	.04
Bark, African .....ton	...	32.00	26.00	32.00	22.00	31.00
Marble Flour, bulk.....ton	12.00	13.00	12.00	13.00	12.00	13.00
Mercuric chloride .....lb.	.88	.93	.82	.93	.67	.87
Mercury metal....76 lb. flask	...	74.00	66.50	79.00	48.00	69.00
Meta-nitro-aniline .....lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-para-oluidine 200 lb. bbls .....lb.	1.40	1.55	1.40	1.55	1.40	1.55
Meta-phenylene-diamine 300 lb bbls .....lb.	.80	.84	.80	.84	.80	.84
Peroxide, 100 lb cs.....lb.	1.20	1.25	1.20	1.25	1.00	1.25
Silicofluoride, bbls .....lb.	.09	.10	.09	.11	.08¾	11.
Stearate, bbls .....lb.	.19	.20	.19	.20	.16½	.20
Meta-toluene-diamine, 300 lb. bbls .....lb.	.67	.69	.67	.69	.67	.69
Methanol (Wood Alcohol)						
*Crude, tanks .....gal.	...	.25	...	.25	.20	.20
95% tanks .....gal.	.33	.35	.33	.35	.33	.35
97% tanks .....gal.	.34	.39	.34	.39	.34	.39
*Pure, Synthetic drs cars.gal.	...	.40	...	.40	.37½	.40
*Synthetic, tanks .....gal.	...	.35½	...	.35½	...	.35½
*Denat. grade, tanks....gal.	...	.43	.40	.43	.35	.40
Methyl Acetate drs 82%.gal.	.12	.13	.12	.13	.12	.13
99% tanks .....gal.	...	.15	...	.15	...	.15
Acetone, drums† .....gal.	.53½	.56	.53½	.57	.43	.57
Hexyl Ketone, pure...lb.	...	1.20	...	1.20	...	1.20
Anthraquinone .....lb.	.65	.67	.65	.67	.65	.67
Butyl Ketone, tanks....lb.	...	.10½	.10½	.10½	...	...
Cellosolve (See Ethylene Glycol Mono Methyl Ether)						
Chloride, 90 lb cyl.....lb.	.45	.45	.45	.45	.45	.45
Ethyl Ketone, tanks.....lb.	...	.07½	.07½	.07½	...	...
Propyl carbinol, drums..lb.	.60	.75	.60	.75	...	...
Mica, dry grd. bags wks..lb.	65.00	80.00	65.00	80.00	65.00	80.00
Michler's Ketone, kegs....lb.	...	2.50	...	2.50	2.50	3.00
Molasses, blackstrap, tanks f.o.b. N. Y. .....gal.	.06	.06⅜	.06	.09	.04½	.07
Monoamylamine, drs, wks.lb.	...	1.00	...	1.00	...	...
Monochlorobenzene, drums, see Chlorobenzene, mono.						
Monomethylparaminosulfate, 100 lb drums.....lb.	3.75	4.00	3.75	4.00	3.75	4.00
Montan Wax, crude, bags.lb.	.10½	.11	.10	.11	.03¾	.10
Myrobalans 20%, liq bbls..lb.	.03¾	.04¼	.03¾	.04¼	.03¼	.04¼
50% Solid, 50 lb boxes.lb.	.06	.06¼	.06	.06¼	.05	.06¼
J1 bags .....ton	...	25.00	25.00	32.00	27.00	35.00
J2 bags .....ton	...	16.00	16.00	18.00	15.00	22.00
R2 bags .....ton	16.00	16.50	16.25	18.00	15.00	22.00
Naphtha. v.m. & p. (deodorized) tanks, Group 3 tanks .....gal.	...	.06⅞	.06¼	.07¼	...	...
Bayonne, tanks.....lb.	...	.09½	...	.09½	.08½	.09½
Naphthalene balls, 250 lb bbls wks. .....lb.	.06	.07	.06	.07	.05½	.07
Crude, imp .....100 lb.	1.15	1.90	1.75	2.15	1.75	2.15
Crushed, chip. bgs wks..lb.	...	.05	...	.05	...	.05
Flakes, 175 lb bbls wks.lb.	...	.07¼	...	.07¼	...	.07¼
Nickel Chloride, bbls.....lb.	.18	.19	.18	.19	.17	.19
Oxide, 100 lb kegs NY..lb.	.35	.37	.35	.37	.35	.37
Salt bbl 400 bbls lb NY.lb.	.11½	.12	.11½	.12	.11	.13
Single, 400 lb bbls NY.lb.	.11½	.12	.11½	.12	.11	.12
Metal ingot.....lb.	.35	.35	.35	.35	.35	.35
Nicotine, free 40%, 8 lb tins, cases	8.25	10.15	8.25	10.15	...	...
Sulfate, 55 lb. drums...lb.	.67	.75	.67	.75	.67	.75
Nitre Cake, blk.....ton	12.00	14.00	12.00	14.00	10.00	14.00
Nitrobenzene, redistilled, 1000 lb. drs wks‡.....lb.	.08½	.11	.08½	.11	.08½	.11
Nitrocellulose, c-l-l-cl, wks.lb.	.27	.33	.27	.33	.27	.33
Nitrogenous Mat'l., bulk.unit	2.55	2.60	2.35	3.25	1.50	3.50
Nitronaphthalene, 550 lb bbls. .....lb.	.24	.25	.24	.25	.24	.25
Nutgalls Aleppy, bags....lb.	...	.18	...	.18	...	.18
Chinese. bags.....lb.	.17	.18	.17	.18	.17	.18
Oak Bark, ground.....ton	30.00	35.00	30.00	35.00	30.00	35.00
Whole .....ton	20.00	23.00	20.00	23.00	20.00	23.00
Extract, 25% tan., bbls..lb.	.03½	.03½	.03⅜	.03½	...	...
Orange-Mineral, 1100 lb casks NY ..... lb.	.09¼	.10	.09¼	.10½	.09½	.10¾

* Delivered basis (east of Miss. River). ‡ Higher price is for lcl quantities. † Zone 1 prices; other zone prices vary.

Current — Orthoaminophenol to Phosphorous Oxychloride

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Orthoaminophenol, 50 lb kgs. ....lb.	2.15	2.25	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs.lb.	1.00	1.15	1.00	1.15	1.00	1.15
Orthochlorophenol, drums.lb.	.50	.65	.50	.65	.50	.65
Orthocresol, drums.....lb.	.13	.15	.13	.15	.13	.15
Orthodichlorobenzene, 1000 lb. drums .....lb.	.05½	.06	.05½	.06	.05½	.06
Orthonitrochlorobenzene, 1200 lb drs wks.....lb.	.28	.29	.28	.29	.28	.29
Orthonitrotoluene, 1000 lb drs wk .....lb.	.05½	.06	.05½	.06	.05½	.06
Orthonitrophenol, 350 lb dr. .....lb.	.52	.80	.52	.80	.52	.90
Orthotoluidine, 350 lb bbl l-c-l .....lb.	.14	.15	.14	.15	.14	.22
Orthonitroparachlorphenol, tins .....lb.	.70	.75	.70	.75	.70	.75
Osage Orange, crystals...lb.	.16	.17	.16	.17	.16	.17
51 deg. liquid.....lb.	.07	.07¾	.07	.07¾	.06	.07¾
Powdered, 100 lb bags..lb.	.14½	.15	.14½	.15	.14½	.15
Paraffin, refd, 200 lb cs slabs 123-127 deg. M. P.....lb.	.047	.04¾	.04½	.04¾	.02	.04½
128-132 deg. M. P.....lb.	.0505	.0515	.04¾	.0515	.03⅞	.04¾
133-137 deg. M. P.....lb.	.0575	.07	.05	.07	.043	.05¾
Para Aldehyde, 110-55 gal. drs. .....lb.*	.16	.18	.16	.18	.16	.18
Aminoacetanilid, 100 lb. bg. .....lb.	.52	.60	.52	.60	.52	.60
Aminohydrochloride, 100 lb. kegs .....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs.lb.	.78	.80	.78	.80	.78	.80
Chlorophenol, drums....lb.	.50	.65	.50	.65	.50	.65
Coumarone, 330 lb drs..lb.	...	...	...	...	...	...
Cymene, refd, 110 gal dr. .....gal.	2.25	2.50	2.25	2.50	2.25	2.50
Dichlorobenzene, 150 lb bbls wks.....lb.	.16	.20	.16	.20	.15	.18
Nitroacetanilid, 300 lb. bbls .....lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls wks .....lb.	.48	.55	.48	.55	.48	.55
Nitrochlorobenzene, 1200 lb. drs. wks.....lb.	.23½	.24	.23½	.24	.23½	.26
Nitro-orthotoluidine, 300 lb. bbls .....lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol 185 lb bbls.lb.	.45	.50	.45	.50	.45	.50
Nitrosodimethylaniline, 120 120 lb. bbls.....lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls.lb.	.35	.37	.35	.37	.29	.37
Phenylenedamine, 350 lb bbls. .....lb.	1.25	1.30	1.25	1.30	1.15	1.30
Para Tertiary amyl phenol wks, drums .....lb.	...	.50	...	.50	...	...
Toluenesulfonamide, 175 lb bbls. .....lb.	.70	.75	.70	.75	.70	.75
Toluenesulfonchloride, 410 lb bbls wks.....lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls wk .....lb.	.56	.60	.56	.60	.56	.60
Paris Green, Arsenic Basis 100 lb kegs.....lb.	...	.23	...	.23	...	.24
250 lb kegs.....lb.	...	.22	...	.22	...	.23
Perchlorethylene, 50 gal dr.lb.	...	.15	...	.15	...	...
Persian Berry Ext, bbls..lb.	.25	Nom.	.25	Nom.	.25	Nom.
Pentane, normal, 28-38° C, group 3, tanks.....gal.	...	.09	...	.09	...	...
Pentasol (see Alcohol, Amyl)						
Pentasol Acetate (see Amyl Acetate)						
Petrolatum, Green, 300 lb. bbl. .....lb.	.01⅞	.02	.01⅞	.02	.01⅞	.02
Petroleum Ethers, tks. 30-60°, Group 3.....gal.	...	.13	.11	.13	.10	.11
Petroleum solvents and diluents						
Cleaners' naphtha, Group 3, tanks .....gal.	...	.06⅞	.06¼	.07⅜	.05	.07¾
Lacquer diluents, Bayonne, tanks .....gal.	.12	.12½	.12	.12½	.12	.12¾
Group 3, tanks....gal.	.07⅞	.08	.06⅞	.08⅜	.06¼	.08⅛
Petroleum thinner 47-49° tanks, Group 3.....gal.	...	.05⅞	.05⅞	.06⅜	...	...
Rubber solvent, stand. grade tanks, Group 3.gal.	...	.06⅞	.06⅜	.06⅞	.05	.06⅞
East Coast tanks....gal.	...	.09½	...	.09½	.09	.09½
Stoddard solvents 48-50 deg. tanks, Group 3.....gal.	...	.06⅜	.05¾	.07⅛	.04½	.06⅝
East Coast tanks....gal.	...	.09½	...	.09½	.09	.09½
Phenol, 250-100 lb drums.lb.	.14¼	.15	.14¼	.15	.14¼	.15
Phenyl-Alpha-Naphthylamine, 100 lb kegs.....lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drums..lb.	...	.16	...	.16	...	...
Phenylhydrazine Hydrochloride .....lb.	2.90	3.00	2.90	3.00	2.90	3.00
Phloroglucinol, tech.....lb.	15.00	16.50	15.00	16.50	...	...
CP .....lb.	20.00	22.00	20.00	22.00	...	...
Phosphate Acid (see Superphosphate)						
Phosphate Rock, f.o.b. mines Florida Pebble, 68% basis .....ton	...	3.25	2.85	3.25	2.75	3.25
70% basis .....ton	...	3.75	3.35	3.75	3.25	3.90
72% basis .....ton	...	4.25	3.85	4.25	3.75	4.35
75-74% basis .....ton	...	5.25	4.90	5.30	4.75	5.50
75% basis .....ton	...	5.35	5.05	5.40	4.85	5.75
77-80% basis .....ton	...	6.25	5.90	6.25	5.75	6.30
Tennessee, 72% basis..ton	...	4.75	4.75	5.00	...	5.00
Phosphorous Oxychloride 175 lb. cyl.....lb.	.16	.20	.16	.20	.16	.23
Red, 110 lb cases.....lb.	.44	.45	.44	.45	.40	.45
Yellow, 110 lb cs wks.lb.	.28	.33	.28	.33	.27½	.33

* Higher price is for lcl quantities.

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This has given Koppers a thorough knowledge of the coals from which tar products are produced.

2. KOPPERS BUILT OVER 75% OF ALL THE BY-PRODUCT OVENS IN THE UNITED STATES
This has made Koppers more familiar than any other organization with the processes of tar production.

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SOLVENT NAPHTHA
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CRESYLIC ACID (98% Pale . . . Low Boiling)
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KOPPERS BUILDING
PITTSBURGH, PA.

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CHEMICAL MFG. CO.

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Anhydrous Ammonia
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Established 1916
Petrolia **Pennsylvania**

COPPERAS

(Iron Sulphate)

Granular and Crystals

•

E. M. SERGEANT PULP & CHEMICAL CO., INC.
Empire State Bldg., **New York City**

Phosphorous Oxychloride
Satin, White

Prices

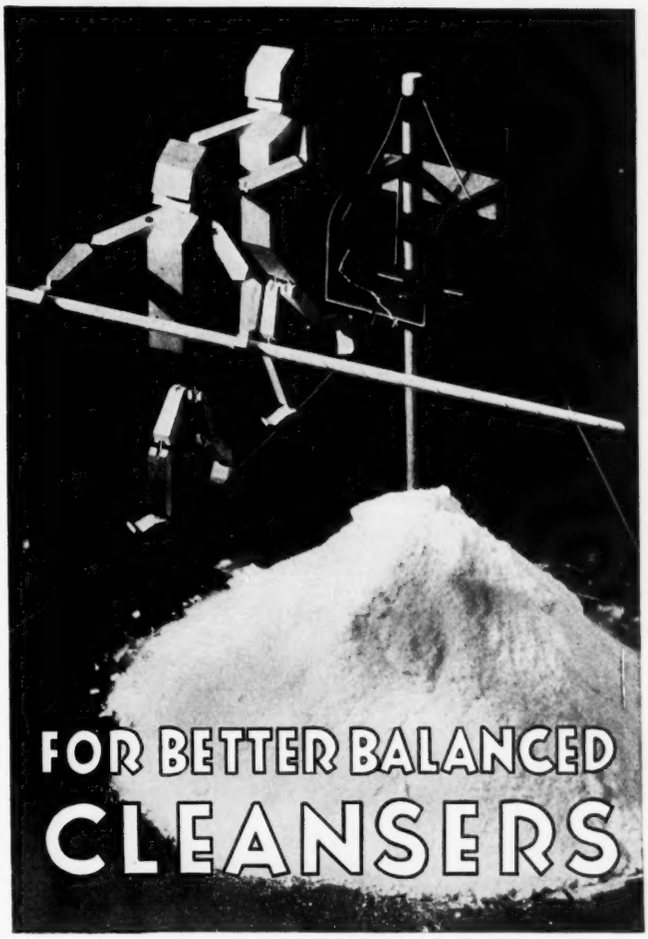
	Current Market	1934 Low	1934 High	1933 Low	1933 High
Phosphorous Sesquisulfide, 100 lb cs .....lb.	.38	.38	.44	.38	.44
Trichloride, cylinders...lb.	.16	.16	.20	.16	.23
Phthalic Anhydride, 100 lb wks .....lb.	.14½	.14½	.15	.13½	.16
Pigments Metallic, Red or or brown bags, bbls, Pa. wks .....ton	37.00	37.00	45.00	37.00	45.00
Pine Oil, 55 gal drs or bbls. Destructive dist.....lb.	.59	.59	.62	.59	.62
Steam dist. wat. wh. bbls. .....gal.	.64	.64	.65	...	...
Prime bbls.....bbl.	8.00	8.00	10.60	8.00	10.60
Pitch Hardwood, wks....ton	...	...	20.00	20.00	25.00
Plaster Paris, tech, 250 lb. bbls. .....bbl.	3.40	3.40	3.50	3.30	3.50
Platinum, Refined .....oz.	35.00	35.00	38.00	24.00	38.00
Potash, Caustic, wks, sol..lb.	.06¼	.06¼	.07⅜	.06⅛	.07⅜
flake .....lb.	.07	.07	.08¼	.0705	.08¼
Liquid tanks .....lb.	...	.02⅞	.03⅝	...	...
Potash Salts, Rough Kainit 14% basis† .....ton	...	9.70	...	9.70	...	9.70
Manure Salts, imported 20% basis bulk.....ton	...	8.60	8.60	12.00	...	12.00
30% basis bulk.....ton	...	12.90	12.90	19.15	...	19.15
Domestic, cif ports, blk.unit	...	.43	...	...	...	...
Potassium Acetate.....lb.	.27	.27	.28	.27	.27	.28
Potassium Muriate, 80% basis bags .....ton	...	22.00	22.00	37.15	...	37.15
Domestic, bulk .....unit	...	.40	...	...	...	...
Pot. & Mag. Sulfate, 48% basis bags .....ton	...	22.50	22.50	25.00	25.00	27.80
Potassium Sulfate, 90% basis bags .....ton	...	35.00	35.00	42.15	42.15	47.50
Potassium Bicarbonate, USP, 320 lb bbls.....lb.	.07½	.07½	.09	.07½	.09
Bichromate Crystals, 725 lb casks .....lb.	.08⅛	.08⅛	.08⅝	.08⅛	.08⅝	.07¼	.08⅝
Binoxalate, 300 lb bbls.lb.	.22	.22	.23	.14	.23	.14	.17
Bisulfate, 100 lb kegs..lb.	.16	.16	.30	.16	.30	.16	.30
Carbonate, 80-85% calc 800 lb casks.....lb.	.07	.07	.07½	.07	.07½	.04⅞	.07½
Chlorate crystals, powd. 112 lb keg wks.....lb.	...	.09	.08½	.09	.08	.09
Chloride, crys. bbls.....lb.	.04	.04¼	.04	.04¼	.04	.04¼
Chromate, kegs.....lb.	.23	.28	.23	.28	.23	.28
Cyanide, 110 lb. cases..lb.	.55	.60	.55	.60	.50	.60
Iodide, 75 lb. bbls.....lb.	...	1.40	1.40	2.70	2.35	2.70
Metabisulfite, 300 lb bbl.lb.	.10½	.11	.10	.11	.10½	.11
Oxalate, bbls.....lb.	.16	.24	.1[illegible]	.24	.16	.24
Perchlorate, cask wks...lb.	.09	.11	.09	.11	.09	.11
Permanganate, USP, crys. 500 & 1000 lb drs wks lb.	.18½	.19½	.18½	.19½	.17½	.19½
Prussiate, red, 112 lb kg.lb.	.39	.41	.35	.39	.39	.41
Yellow, 500 lb casks..lb.	.18	.19	.18	.19	.16½	.19
Tartrate Neut, 100 lb kg.lb.	...	.21	...	.21	...	.21
Titanium Oxalate, 200 lb bbls. .....lb.	.32	.35	.32	.35	...	...
Propane, group 3, tanks.....	...	.07	...	.07	...	.07
Pumice Stone, lump bags.lb.	.04½	.06	.04½	.06	.04	.06
250 lb bbls.....lb.	.05	.07	.05	.07	.04½	.07
Powdered, 350 lb bags..lb.	.02½	.03	.02½	.03	.02½	.03
Putty, comml., tubs...100 lb.	...	2.25	...	2.25	2.00	2.25
Linseed Oil, kegs...100 lb.	4.00	4.50	4.00	4.50	3.40	4.50
Pyridine, 50 gal drums...gal.	...	1.25	...	1.25	.85	1.25
Pyrites, Spanish cif Atlantic ports bulk.....unit	.12	.13	.12	.13	.12	.13
Pyrocatechin, CP .....lb.	2.75	3.00	2.75	3.00	...	...
Quebracho, 35% liq. tks...lb.	...	.02⅜	.02¼	.02⅜	.02	.02⅜
450 lb bbls c-l.....lb.	...	.02⅞	.02¾	.02⅞	.02⅜	.02⅞
Solid, 63%, 100 lb bales cif .....lb.	...	.02⅞	.02⅞	.03⅛	.02⅜	.03⅛
Clarified, 64%, bales..lb.	...	.03	.03	.03½	.02⅜	.03½
Quercitron, 51 deg liquid 450 lb. bbls.....lb.	.06	.06½	.05½	.06½	.05½	.06
Solid, 100 lb boxes.....lb.	.10	.12	.09½	.13	.09½	.13
Bark, Rough.....ton	...	14.00	...	14.00	...	14.00
Ground .....ton	34.00	35.00	34.00	35.00	34.00	35.00
R Salt, 250 lb bbls wks...lb.	.40	.44	.40	.44	.40	.44
Resorcinol tech, cans ....lb.	.75	.80	.65	.80	.65	.70
Rochelle Salt, cryst.....lb.	.14½	.15	.12½	.16	...	...
Rosin Oil, bbls, first run gal.	...	.48	.45	.48	.42	.46
Second run.....gal.	...	.53	.50	.53	.46	.51
FF Wood Rosin, c.l. NY..	...	5.10	5.10	6.13	...	...
Rosins 600 lb bbls 280 lb..unit ex. yard N. Y.						
B	...	5.35	4.50	5.75	2.75	5.15
D	...	5.45	4.60	5.85	2.95	5.15
E	...	5.45	4.80	6.50	3.55	5.15
F	...	5.45	5.00	6.75	3.85	5.17½
G	...	5.50	5.05	6.75	3.90	5.17½
H	...	5.50	5.10	6.75	4.00	5.17½
I	...	5.55	5.15	6.75	4.05	5.20
K	...	5.55	5.30	6.75	4.60	5.20
M	...	5.60	5.45	6.80	4.35	5.25
N	...	5.85	5.50	6.80	4.75	5.40
WG	...	6.15	5.70	6.80	4.80	5.60
WW	...	6.40	5.90	6.85	4.85	6.20
Rotten Stone, bags mines.ton	23.50	24.00	23.50	24.00	23.50	24.00
Lump, imported, bbls...lb.	.05	.07	.05	.07	.05	.07
Selected bbls.....lb.	.09	.12	.09	.12	.09	.12
Powdered, bbls.....lb.	.02½	.05	.02½	.05	.02	.05
Sago Flour, 150 lb bags..lb.	.02½	.03	.02½	.03	.02½	.03
Sal Soda, bbls wks...100 lb.	1.10	1.10	1.10	1.10	.90	1.10
Salt Cake, 94-96% c-l wks. ton	13.00	18.00	13.00	18.00	13.00	18.00
Chrome .....ton	12.00	13.00	12.00	13.00	12.00	13.00
Saltpetre, double refd granular 450-500 lb bbls...lb.	.059	.06¼	.059	.06¼	.05¾	.06¾
Satin, White, 550 lb bbls..lb.	...	.01½	...	.01½	...	.01½

* Higher price is for lcl quantities.
† Plus discounts, based on time of purchase and delivery.

Current

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Shellac Bone dry bbls†...lb.	.32	.26	.37	.18	.28
Garnet, bags† .....lb.	.26	.24	.31	.15	.20
Superfine, bags‡ .....lb.	.28	.23	.31	.09½	.18¾
T. N. bags‡ .....lb.	.26	.27	...	...	...
Schaeffer's Salt kegs.....lb.	.48	.48	.50	.48	.50
Silica, Crude, bulk mines.ton	8.00	8.00	11.00	8.00	11.00
Refined, floated bags...ton	22.00	22.00	30.00	22.00	30.00
Air floated bags.....ton	...	...	32.00	...	32.00
Extra floated bags...ton	30.00	30.00	35.00	30.00	35.00
Silver Nitrate, vials.....oz.	...	.35⅜	.31⅞ .35½	...	...
Soda Ash, 58% dense, bags c-l wks.....100 lb.	...	1.25	...	1.25	1.17½ 1.25
58% light, bags....100 lb.	...	1.23	...	1.25	1.17½ 1.23
Soda Caustic, 76% grnd & flake drums.....100 lb.	...	3.00	...	3.00	2.90 3.00
76% solid drs.....100 lb.	...	2.60	...	2.60	2.50 2.60
Liquid sellers tanks, 100 bls.	...	2.25	...	2.25	2.15 2.25
Sodium Abietate, drs.....lb.	...	.08	.03	.08	... .03
Acetate, tech 450 lb. bbls wks .....lb.	.04½	.05	.04½	.05	.04¼ .05
Alignate, drs. .....lb.	...	.64	.50	.64	... .50
Aresenate, drums.....lb.	.07¾	.08¾	.07¾	.08¾	.07¾ .08¾
Arsenite, drums.....gal.	.40	.75	.40	.75	.05 .75
Benzoate U.S.P., kegs..lb.	.46	.48	.45	.48	... ...
Bicarb, 400 lb bbl...100 lb.	...	2.25	...	2.25	... 2.25
Bichromate, 500 lb cks wks. .....lb.	.06⅛	.06⅝	.06⅛	.06⅝	.044 .07
Bisulfite, 500 lb bbl wks.lb.	.03¼	.036	.03	.036	.02¾ .0335
Chlorate, wks.....lb.	.06¼	.07½	.06¼	.07½	.05¾ .07¾
Chloride, technical....ton	13.60	16.50	11.40	16.50	11.40 14.00
Cyanide, 96-98%, 100 & 250 lb. drums wks.....lb.	.15½	.16½	.15½	.16½	.15½ .16
Fluoride, 300 lb bbls wks .....lb.	.07½	.09½	.07½	.09½	.07 .07½
Hydrosulfite, 200 lb bbls f.o.b wks.....lb.	.19½	.21	.19½	.21	.20 .21
Hypochloride solution, 100 lb. cbys. .....lb.	...	.05	...	.05	... .05
Hyposulfite, tech, pea crys 375 lb bbls wks..100lb.	2.40	3.00	2.40	3.00	2.40 3.00
Technical, regular cryst. 375 lb bbls wks.100 lb.	2.40	2.65	2.40	2.65	2.40 2.65
Iodide .....lb.	...	2.40	2.40	3.50	3.10 3.50
Metanilate, 150 lb bbls..lb.	.41	.42	.41	.42	.44 .45
Metasilicate, c-l, wks.100 lb.	2.65	3.05	2.65	3.05	2.65 3.25
Monohydrate, bbls.....lb.	...	.02½	...	.02½	... .02½
Napthenate .....lb.	...	.13	...	.13	... ...
Naphthionate, 300 lb bbl.lb.	.52	.54	.52	.54	.52 .54
Nitrate, 92%, crude, 200 lb. bags c-l NY.....ton	...	24.80	24.80	26.30	1.26z 1.31½z
100 lb. bags .....ton	...	25.50	25.50	27.00	... ...
Bulk .....ton	...	23.50	23.50	24.50	... ...
Nitrite, 500 lb bbls spot.lb.	.07¼	.08	.07¼	.08	.07¼ .08
Orthochlorotoluene, sulfonate. 175 lb bbls wks.lb.	.25	.27	.25	.27	.25 .27
Perborate, 275 lb bbls..lb.	.18	.19	.18	.19	.17 .19
Peroxide, bbls. 400 lb...lb.	...	.17	...	.17	... ...
Phosphate, di-sodium, tech. 310 lb bbls,wks.100 lb.	...	2.20	2.10	2.40	2.00 2.40
tri-sodium, tech, 325 lb bbls, wks .....100 lb.	...	2.60	2.60	2.70	2.15 2.50
Picramate, 160 lb kegs..lb.	.67	.69	.69	.72	.69 .72
Prussiate, Yellow, 350 lb bbl. wks.....lb.	.11½	.12	.11½	.12	.11½ .12
Pyrophosphate, 100 lb kg.lb.	.16½	.18	.16½	.18	.15 .20
Silicate, 60 deg 55 gal drs, wks. .....100 lb.	1.65	1.70	1.65	1.70	1.65 1.70
40 deg 35 gal drs, wks .....100 lb.	...	.80*	...	.80*	.75 .80
Silicofluoride, 450 lb bbls NY .....lb.	.04¾	.05	.04¾	.06	.04½ .06
Stannate, 100 lb. drums.lb.	.33½	.36	.33½	.37½	.18 .37
Stearate, bbls.....lb.	.20	.25	.20	.25	.20 .25
Sulfanilate, 400 lb. bbls..lb.	.16	.18	.16	.18	.16 .18
Sulfate Anhyd, 550 lb bbls c-l wks.....lb.	.022	.0285	.022	.0285	.02 .0285
Sulfide, 80% crystals, 440 lb bbls wks.....lb.	...	.02¼	.02¼	.02½	.02½ .02¾
62% solid, 650 lb drums c-l wks.....lb.	...	.03	...	.03	... .03
Sulfite, crystals, 400 lb bbls wks .....lb.	.02¼	.02½	.02¼	.02½	.03 .03¼
Sulfocyanide, bbls.....lb.	.28	.35	.28	.35	.28 .35
Tungstate, tech, crystals, kegs .....lb.	83	.88	.70	.88	.57 .67
Spermaceti, blocks, cases..lb.	...	.20	.18	.20	.17 .22
Cakes, cases .....lb.	...	.21	.19	.21	.18 .23
Spruce Extract, ord., tks..lb.	...	.01	...	.01	.00⅞ .01
Ordinary, bbls.....lb.	...	.01½	...	.01½	.01¼ .01½
Super spruce ext, tks....lb.	...	.01⅞	...	.01⅜	.01¼ .01⅝
Super spruce ext., bbls..lb.	...	.01⅞	...	.01⅞	.01⅝ .01⅞
Super spruce ext, powd., bags .....lb.	...	.04	...	.04	... .04
Starch, powd, 140 lb bags ..... 100 lb.	3.56	3.76	2.81	3.76	2.29 3.01
Pearl, 140 lb bags...100 lb.	3.46	3.66	2.71	3.66	2.19 2.91
Potato, 200 lb bags.....lb.	.05¼	.06	.05¼	.06	.03¾ .06
Imported bags .....lb.	.06	.06½	.06	.06½	.04¾ .06½
Starch, Potato Soluble....lb.	.08	.08½	.08	.08½	.08 .08½
Rice, 200 lb bbls.....lb.	.07½	.08½	.07½	.08½	.07 .08½
Wheat, thick bags.....lb.	.06¼	.06¾	.06¼	.06¾	.05¾ .06¾
Thin bags.....lb. .10	.10¼	.10	.10	.10¼	.09½ .10¼
Strontium carbonate, 600 lb. bbls wks.....lb.	.07¼	.07½	.07¼	.07½	.07¼ .07½
Nitrate, 600 lb bbls NY.lb.	.10½	.11	.10½	.11	.07 .11
Peroxide, 100 lb drs....lb.	...	1.25	...	1.25	... 1.25
Sulfur Brimstone, bkn. rock, 250 lb bag c-l....100 lb.	...	2.05	...	2.05	... 2.05

* Tanks, 15c less; † Bone dry and refined shellac prices at Chicago, 1c higher; Boston, ½c; Pacific Coast, 3c; Philadelphia deliveries, fob, N. Y. City. ‡ T. N. and superfine prices quoted fob, N. Y. City and Boston; Chicago prices, 1c higher; Philadelphia deliveries, fob, N. Y. City. z Price per 100 lbs.



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Sulfur Brimstone
Zinc Cyanide

Prices

		Current Market	1934 Low	1934 High	1933 Low	1933 High
Sulfur	...	.27	.20	.29	.08½	.17¾
Crude, f.o.b. mines	ton	18.00	19.00	18.00	19.00	18.00	19.00
Flour for dusting 99½%, 100 lb bgs c-l NY	100 lb.	...	2.40	...	2.40	...	2.40
Heavy bags c-l	100 lb.	...	2.50	...	2.50	...	2.50
Flowers, 100%, 155 lb bbls c-l NY	100 lb.	...	3.45	...	3.45	...	3.45
Roll, bbls l-c-l NY	100 lb.	2.65	2.85	2.65	2.85	2.65	2.85
Sulfur Chloride, red, 700 lb drs wks	lb.	.05	.05½	.05	.05½	.05	.05½
Yellow, 700 lb. drs wks	lb.	.03½	.04½	.03½	.04½	.03½	.04½
Sulfur Dioxide, 150 lb cyl.	lb.	.07	.08	.07	.08	.07	.08
Extra, dry, 100 lb cyl.	lb.	.11	.13	.11	.13	.10	.13
Sulfuryl Chloride	lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, ground	ton	62.00	63.00	62.00	75.00	50.00	75.00
Talc, Crude, 100 lb bags NY	ton	12.00	15.00	12.00	15.00	12.00	15.00
Refined, 100 lb bags NY	ton	16.00	18.00	16.00	18.00	16.00	18.00
French, 220 lb bags NY	ton	27.50	30.00	27.50	30.00	18.00	30.00
Refined, white, bags	ton	45.00	60.00	45.00	60.00	35.00	60.00
Italian, 220 lb bags to arr.	ton	70.00	75.00	70.00	75.00	48.50	75.00
Refined, white bags NY	ton	75.00	80.00	75.00	80.00	50.00	80.00
Superphosphate, 16% bulk, wks	ton	...	8.50	8.00	8.50	6.50	8.00
Run of pile	ton	...	8.00	7.50	8.00	6.00	7.50
Tankage Ground NY	unit	...	2.90*	2.50*	3.25*	1.70	2.75*
Unground	unit	...	2.50*	2.00*	2.75*	2.35*	2.60*
Fert. grade f.o.b. Chicago	unit	...	1.55*	1.80	2.40*	1.40	3.00
South American cif	unit	...	2.85*	2.75	3.10*	...	2.50
Tapioca Flour, high grade bgs.	lb.	.03	.05	.03	.05	.03	.05
Medium grade, bgs.	lb.	.03	.04	.03	.04	.03	.04
Tar Acid Oil, 15%, drs.	gal.	.21	.22	.21	.22	.20	.22
25% drums	gal.	.23	.24	.23	.24	.22	.24
Tartar Emetic, Tech.	gal.	...	.22¾	.23	.23	...	...
U. S. P.	gal.	.28	.28½	.27	.28½	...	...
Terra Alba Amer. No. 1, bgs or bbls mills	100 lb.	1.15	1.75	1.15	1.75	1.15	1.75
No. 2 bgs or bbls.	100 lb.	1.00	1.25	1.00	1.25	1.00	1.25
Imported bags	lb.	.01⅛	.01¼	.01⅛	.01¼	.01⅛	.01¼
Tetrachlorethane, 50 gal dr	lb.	.08½	.09	.08½	.09	.08½	.09
Tetralene, 50 gal drs wks.	lb.	.12	.13	.12	.13	.12	.13
Thiocarbanilid, 170 lb bbl.	lb.	.20	.25	.20	.25	.25	.28½
Tin							
Crystals, 500 lb bbls wks	lb.	.38	.38½	.30	.40½	.24	.41
Metal Straights NY	lb.	...	.50⅜	.50⅞	.55⅜	.23	.57
Oxide, 300 lb bbls wks.	lb	.56	.58	.55	.60	.27½	.59
Tetrachloride, 100 lb drs wks.	lb.	.25½	.26	.25½	.28½	.26	.28
Titanium Dioxide 300 lb bbl.	lb.	.17¼	.19¼	.17¼	.19¼	.17¼	.19¼
Calcium Pigment, bbls.	lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Toluene, 110 gal drs.	gal.	...	.35	...	.35	...	.35
8000 gal tk cars wks.	gal.	...	.30	...	.30	...	.30
Toluidine, 350 lb bbls.	lb.	.88	.89	.88	.89	.88	.89
Mixed, 900 lb drs wks.	lb.	.27	.28	.27	.28	.27	.28
Toner Lithol, red, bbls.	lb.	.75	.80	.75	.85	.80	.95
Para, red, bbls.	lb.	...	.75	.75	.80	...	.80
Toluidine	lb.	...	1.35	...	1.35	1.35	1.55
Triacetin, 50 gal drs wks.	lb.	.32	.36	.32	.36	.32	.36
Triamyl Borate, drs, wks.	lb.	...	.40	...	.40	...	...
Triamylamine, drs, wks.	lb.	...	1.25	1.00	1.25	...	...
Trichlorethylene, 50 gal dr.	lb.	.09½	.10	.09½	.10	.09½	.10
Triethanolamine, 50 gal drs	lb.	.35	.38	.35	.38	.35	.38
Tricresyl Phosphate, drs.	lb.	.19	.26	.19	.26	.19	.26
Triphenyl guanidine	lb.	.58	.60	.58	.60	.58	.60
Phosphate, drums	lb.	.37	.39	.37	.39	.37	.39
Tripoli, 500 lb bbls.	100 lb.	.75	2.00	.75	2.00	.75	2.00
Tungsten, Wolframite	per unit	15.00	15.25	12.00	15.25	10.00	12.50
Turpentine carlots, N Y dock bbls	gal.	...	.46¼	.46¼	.63½	.46¼	.51½
Savannah, bbls	gal.	...	.41¼	.41¼	.58½	...	...
Jacksonville, bbls	gal.	...	.41¼	.41¼	.58½	...	...
Wood Steam dist, bbls, c-l N. Y.	gal.	...	.41	.41	.61	.42	.48
Urea, pure, 112 lb cases	lb.	.15½	.17	.15	.17	.15	.17
Fert. grade, bags c.i.f.	ton	100.00	120.00	90.00	120.00	82.60	90.00
c.i.f. S. points	ton	100.00	120.00	90.00	120.00	82.60	90.00
Urea Ammonia liq 55% NH_3, tanks	unit	...	.96	...	.96	...	...
Valonia beard, 42%, tannin bags	ton	...	48.00	39.00	48.00	27.50	42.00
Cups, 32% tannin	ton	...	25.50	23.00	27.00	17.00	25.00
Mixture, bark, bags	ton	...	32.00	...	32.00	22.00	28.00
Vermillion, English, kegs.	lb.	1.59	1.70	1.41	1.73	1.05	1.42
Vinyl Chloride, 16 lb cyl.	lb.	...	1.00	...	1.00	...	1.00
Wattle Bark, bags	ton	...	29.50	29.50	34.00	24.00	32.00
Extract 55%, tks, bbls.	lb.	...	.03¾	.03⅝	.03⅞	.03	.03⅞
Whiting, 200 lb bags, c-l wks	100 lb.	.85	1.00	.85	1.00	.85	1.00
Alba, bags c-l NY	ton	...	15.00	...	15.00	13.00	15.00
Gliders, bags c-l NY.	100 lb.	...	1.35	...	1.35	...	1.35
Wood Flour, c-l	bags	18.00†	30.00	18.00†	30.00	18.00	36.00
Xylene, 10 deg tks wks.	gal.	...	.29	...	.29	.29	.29
Commercial, tks wks.	gal.	...	.26	...	.26	...	.26
Xylidine, crude	lb.	.36	.37	.36	.37	.36	.37
Zinc Ammonium Chloride powd., 400 lb bbls.	lb.	.04¾	.05	.04¾	.05	.04¾	.05
Carbonate Tech., bbls NY	lb.	.09½	.11	.09½	.11	.09½	.11
Chloride Fused, 600 lb drs wks.	lb.	.04¼	.05	.04¼	.05	.05	.05¼
Gran, 500 lb bbls wks.	lb.	...	.05⅛	.05⅛	.06	.05⅛	.06
Soln 50%, tks wks.	100 lb.	...	2.00	...	2.00	...	3.00
Cyanide, 100 lb drums.	lb.	.36	.41	.36	.41	.38	.39

* &10. † Depends upon grade.

Current

Zinc Dust
Whale Oil

	Current Market	1934 Low	1934 High	1933 Low	1933 High
Zinc Dust, 500 lb bbls c-l wks ..... lb.	...	.059	.059	.071	.043¼	.07½
Metal, high grade slabs c-l N Y .....100 lb.	...	4.25	4.25	4.87	3.02	5.37
Oxide, Amer., bags wks. lb.	.05¼	.06¼	.05¾	.06¼	.05	.06
French, 300lb bbls wks. lb.	.05¾	.11⅛	.05¾	.11⅛	.05¾	.11⅛
Palmitate, bbls. .....lb.	.21	.22	.20	.22	.17½	.21
Perborate, 100 lb drs..lb.	...	1.25	...	1.25	...	1.25
Peroxide, 100 lb drs....lb.	...	1.25	...	1.25	...	1.25
Resinate, fused, dark, bbls. ..... lb.	.05¾	.06½	.05¾	.06½	.05¾	.06½
Stearate, 50 lb bbls.....lb.	.18	.21	.18	.21	.15	.19
Sulfate, crystals, 400 lb bbl wks .....lb.	.028	.033	.02¾	.033	.03	.03½
Flake, bbls .....lb.	.032	.037	...	...	...	...
Sulfide, 500 lb bbls.....lb.	.13	.13½	.13	.13½	.12	.13½
Sulfocarbolate, 100 lb keg. lb.	.21	.22	.21	.22	.21	.22
Zirconium Oxide, Nat. kegs. lb.	.02½	.03	.02½	.03	.02½	.03
Pure kegs .....lb.	.45	.50	.45	.50	.45	.50
Semi-refined kegs .....lb.	.08	.10	.08	.10	.08	.10
Oils and Fats						
Castor, No. 1, 400 lb bbls. lb.	...	.09¾	...	.09¾	.09¼	.10
No. 3, 400 lb bbls.....lb.	...	.09¾	...	.09¾	.08½	.09¾
Blown, 400 lb bbls.....lb.	.11½	.12¼	.11½	.12¾	.11¼	.12¾
China Wood, bbls spot NY. lb.	.095	.098	.07½	.099	.047⅛	.09⅛
Tanks, spot NY.....lb.	.089	.094	.07¼	.094	.04¼	.08½
Coast, tanks .....lb.	.086	.094	.06⅞	.094	.04⅝	.08⅛
Coconut, edible, bbls NY..lb.	...	.04¾	.04¾	.10¾	...	.10¾
Manila, bbls NY.....lb.	...	.04¼	.03¾	.04¼	.03⅞	.04¾
Tanks, N Y .....lb.	...	.03¼	.02⅝	.03¼	.02¾	.03¾
Tanks, Pacific Coast..lb.	...	.03	.02¼	.03	.02½	.03⅜
Cod, Newfoundland, 50 gal. bbls. .....gal.	.38	Nom.	.34	.40	.19	.35
Copra, bags, N Y.....lb.	...	.017	.012	.017	.0152½	.019
Corn, crude, bbls NY.....lb.	.08½	.08⅝	.04⅝	.08⅝	.04⅝	.07¾
Tanks, mills .....lb.	.07⅜	.06⅜	.03½	.07⅜	.02⅞	.06½
Refined, 375 lb bbls NY. lb.	.09½	.09¾	.05¾	.09¾	.05¾	.08¾
Degras, American, 50 bal bbls N Y .....lb.	...	.03	.02¾	.03	.02½	.03
English, brown, bbls NY. lb.	.07⅜	.04½	.03¾	.04	.02⅞	.04
Greases, Yellow .....lb.	.04⅝	.04⅞	.02⅜	.04⅞	.01¾	.03⅝
White, choice bbls NY..lb.	.04⅝	.05½	.02¾	.05½	.02½	.04⅝
Herring, Coast, tanks....gal.	.17	Nom.	.15	.15	.11	.23
Lard Oil, edible, prime....lb.	...	.09¾	...	.09¾	.08½	.10½
Extra, bbls .....lb.	...	.08	.07	.08	.07½	.08¼
Extra No. 1, bbls.....lb.	...	.07¾	.06⅜	.07¾	.06	.08
Linseed, Raw, less than 5 bbl. lots .....lb.	...	.095	.095	.105	.08	.12
Bbls. c-l spot .....lb.	...	.091	.091	.101	.072	.11
Tanks .....lb.	...	.085	.085	.095	.066	.104
Menhaden, Tanks, Baltimore ..... gal.	.20	.22	.15	.22	.09	.15
Refined, alkali bbl....lb.	...	.062	.057	.069	...	...
Tanks .....lb.	...	.056	.051	.061	...	...
Light Pressed, bbls.....lb.	...	.056	.051	.057	...	...
Tanks .....lb.	...	.05	.045	.05	...	...
Neatsfoot, CT, 20°bbls NY. lb.	...	.16½	...	.16½	.11¾	.16¾
Extra, bbls NY .....lb.	...	.08	.07	.08	.06½	.08¼
Pure, bbls NY .....lb.	...	.12	.12	.13	.07¾	.14
Oleo, No. 1, bbls NY....lb.	...	.11¼	.06	.11½	.05	.06⅞
No. 2, bbls NY.....lb.	...	.11¼	.05⅜	.11¼	.04¼	.06⅜
Olive, denat, bbls NY....gal.	.84	.86	.76	.90	.47	.80
Edible, bbls NY .....gal.	1.55	1.70	1.55	1.90	1.30	1.85
Foots, bbls NY .....lb.	...	.07⅜	.06½	.07⅜	.04⅜	.06¾
Palm, Kernel, casks.....lb.	.0285	Nom.	.02½	.04¼	.04	.04¾
Lagos, 1500 lb casks....lb.	...	.03⅞	.03⅝	.03⅞	.02⅝	.04¾
Niger, casks .....lb.	.03¼	.0340	.03¼	.03¾	.024	.04½
Peanut, crude, bbls NY...lb.	...	.08¾	.06½	.08¾	.03⅛	.07
Refined, bbls NY.....lb.	.09¾	.10	.07½	.10½	.07½	.11
Perilla, bbls NY .....lb.	.09	.09¼	.08½	.09⅝	.05	.10½
Tanks, Coast .....lb.	...	.08⅝	.07½	.09	.03¾	.09¾
Poppyseed, bbls NY.....gal.	1.50	1.60	1.45	1.60	1.45	1.70
Rapeseed, blown, bbls NY. gal.	.08	.082	.08	.082	...	...
Denatured, drms, NY..gal.	...	.38	.37	.44	.34	.65
Red, Distilled ,bbls.....lb.	.07⅜	.08⅜	.06⅞	.08⅜	.05⅞	.07⅝
Tanks .....lb.	...	.06½	.06	.06½	.05	.06
Salmon, Coast, 8000 gal tks ..... gal.	.21	Nom.	.15	.21	.11	.18
Sardine, Pac. Coast tks..gal.	...	.24	.13	.25	.09½	.20
Sesame, edible, yellow, dom. lb.	.12	.12¼	.07½	.13¼	.08½	.10
White, dos. .....lb.	.12	.12¼	.08	.13¼	.10	.11
Soy Bean, crude Pacific Coast .....lb.	...	Nom.	...	Nom.	.032	.035
Domestic tanks, f.o.b. mills ..... lb.	...	.06½	.06	.06½	.027	.035
Crude, bbls NY .....lb.	.071	.075	.066	.071	.04	.095
Refined, bbls NY .....lb.	.076	.087	.071	.087	.04½	.106
Sperm, 38° CT, bleached, bbls N Y .....lb.	.108	.11	.108	.11	...	...
45° CT, bleached, bbls NY ..... lb.	.101	.103	.101	.103	...	...
Stearic Acid, double pressed dist bags .....lb.	.09	.10	.09	.10	.07½	.10
Double pressed saponified bags .....lb.	.09	.10	.09	.10	.08	.10
Triple pressed dist bags..lb.	.11¾	.12¾	.11¾	.12¾	.10¼	.12¾
Stearine, Oleo, bbls.....lb.	.10½	.10⅝	.05	.10⅝	.03½	.06¾
Tallow City, extra loose...lb.	...	.05⅛	.02⅞	.05⅛	.02	.03⅞
Edible, tierces .....lb.	...	.06½	.04¾	.06½	.03½	.05⅛
Tallow Oil, bbls, c-l NY. lb.	.05¾	.06	.05¾	.06	.05¾	.06
Acidless, tanks NY.....lb.	...	.07	.06	.07	.05	.07
Vegetable, Coast mats lb.	.07¼	Nom.	.06	.07¼	.04¼	.06
Turkey Red, single, bbls..lb.	.07½	...	.07½	...	.06¼	.07½
Double, bbls .....lb.	.12½	.13	.12½	.13	.08	.13
Whale						
Winter bleach, bbls NY. lb.	...	.072	...	.072	...	...
Refined, nat, bbls, NY..lb.	.068	.07	.068	.07	...	...

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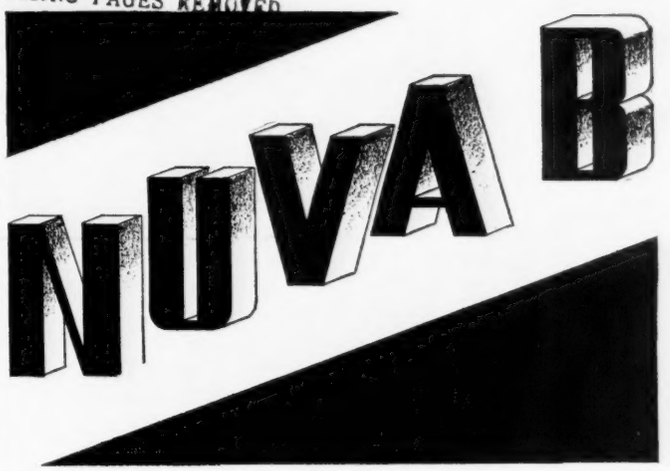

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"We"—Editorially Speaking

"Roosevelt has set to work seriously on one extremely difficult task which I think he stands a very good chance of accomplishing." As the compounder of this statement is a chemical executive who is one of the most serious critics of the New Deal, his three lunch-comrades rose to the bait: "What's that?" they chorused. "I think he stands a very good chance of bankrupting America."

"The South Moves Chemically"—*Chem. & Met.* headline. Nitroglycerin or phenolphthalein?

The colorful story of progress in developing paint colors, during nearly half a century, by R. M. Reed, in this issue, is abstracted from his speech given before the September 10th meeting of the Chicago Paint and Varnish Production Club. Our readers will find it hightly interesting and informative.

Perhaps report by one B. Conte, appearing in the Omaha *Evening World-Herald,* that the possible reason for this year's drought is the taking from the atmosphere large quantities of nitrogen for fixation may tickle the technically inclined, but his closing sentence is what amuses us the most. He queries: "As the abstracting of the nitrogen from the air is only in its early period, what will happen when twice as much will be taken yearly?" Yes Mr. Conte we know the answer, but we do not want to start a price war prematurely. Perhaps Messrs. Norris, Wallace, Tugwell, etc., should be invited to answer too.

We are beginning to suspect that one of the most permanent things is a copy of CHEMICAL INDUSTRIES. We are in receipt of a request from the research department of one of the country's largest glass companies concerning a *news item* that appeared 18 months ago.

Electro Bleaching Gas' most interesting and instructive trade paper advertising campaign (see insert facing page 296 of this issue for sample) is the subject of a feature article in *Printers' Ink* under the title, "It's All Alike, Costs Same." And all this time we have been believing what those various chlorine salesmen have been telling us!

Years before anybody ever even thought of ethyl gas, a callow youth, named Tommy Midgely, went down to Dayton, Ohio, to apply for a job with a cash register concern. After his interviewer began explaining in detail his duties, he mustered up courage to ask how much he was going to be paid for all this work.

"Fifty dollars a week," said the employment officer. "What! $50!"

"Well, $30 to start with."

But he's never made the same mistake since.

A. C. Z. of South Euclid, Ohio, in paying for his subscription, three years in advance, endorses our bill: "I want it clearly understood that this three years' subscription is no sign whatsoever of my agreement with policies expressed in your editorials." We should like to find about five thousand men who disagree with us in exactly the same way.

By reading the newspaper accounts of the Cleveland A.C.S. meeting diligently, we learn from the *N. Y. Times* that "New Wind of Death Was Accidentally Discovered"; and from the *N. Y. Sun* that "Arc Light May Exceed Sun's Brightness," which after all is quite some admission for that paper; but the prize gem is a United Press report in the *N. Y. Journal of Commerce* describing propiophenone as "a figurative 'Lon Chaney' of the test tube." And we understood that the Cleveland meeting was in the main a rather staid and stoggy affair!

Much of the progress of the world, unfortunately, has been at the expense of human misery, suffering and death. And so, perhaps, the Morro Castle dead will lead to greater safety for "those who go down to the sea in ships." Chemistry will play an important part. Will the plastic industry properly capitalize this opportunity? The new *S. S. Washington* construction called for partitions and other decorative effects made of plastic materials, but much more can be done in this direction. It is now quite possible to fireproof draperies and other flimsy and flammable material. According to the testimony, it was this type of material that was responsible for the amazing rapidity with which the fire spread. A chemical engineer might suitably be added to the designing staffs of our leading shipyards.

Occasionally we have "cracked down" hard on the uselessness of much that is done in the name of research. The chemist who worked to find that histamine acid phosphate produces a real hangover is the worst offender this season.

Did you know that Euclid Snow, Mallinckrodt's Chicago man, has been nominated a Director of the American Iris Society and that Warren E. Eaton, scion of Norwich Pharmacal, is President of the Soaring Society of America?

Letter from a well known Middle West chemical jobber: "I get real enjoyment out of your society 'news reel' even though it sometimes includes a picture of —" name deleted by censor.

Wise Guy: "What is the most deadly fluid?"

Chemical Student: "Potassium cyanide because you're dead as soon as it touches you."

Wise Guy: "Wrong—embalming fluid; you're dead before it touches you."—*Yellow Jacket.*

Fifteen Years Ago

From our issues of October, 1919

Quotation from October 29th issue *Drug & Chemical Markets:* "A weak point with the unions is their failure to keep their written pledge when agreements have been signed by their leaders after settlement of disagreements with employers."

Arbitration of chemical disputes to come before Chemical Alliance.

Senator Smoot introduces new anti-dumping bill to prevent cut-throat competition.

Butterworth-Judson sued by Exporters & Manufacturers Products for $3,000,000 commissions on war contracts for picric acid.

Japanese Chemical Industries' Association calls for higher tariff on Japan's imports.